## SUPREME COURT OF THE UNITED STATES.

## OCTOBER TERM, 1913.

## No. 548.

## THE UNITED STATES OF AMERICA, PETITIONER,

V8.

## LEXINGTON MILL AND ELEVATOR COMPANY.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE EIGHTH CIRCUIT.

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George A. Hulett		C. H. Barnard			661
George Freeman (recalled)       765         Hannah L. Wessling       765         G. A. Hulett (recalled)       766         Hannah L. Wessling (recalled)       767         Dr. S. F. Acree       800         Alfred Stengel       814         Dr. S. F. Acree (recalled)       833         Otto Folin       859         William F. Boos       886         Dr. Scott P. Child       932         Dr. Robert T. Sloan       941         Hannah L. Wessling (recalled)       947         A. V. H. Mory       948         C. E. Brewster       955					687
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			Mrs. Charles Kidwell		
			Mrs. L. P. Houston		
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			Mrs. P. L. Williams		1500
			Herbert W. Emerson		
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			Julius T. Willard		
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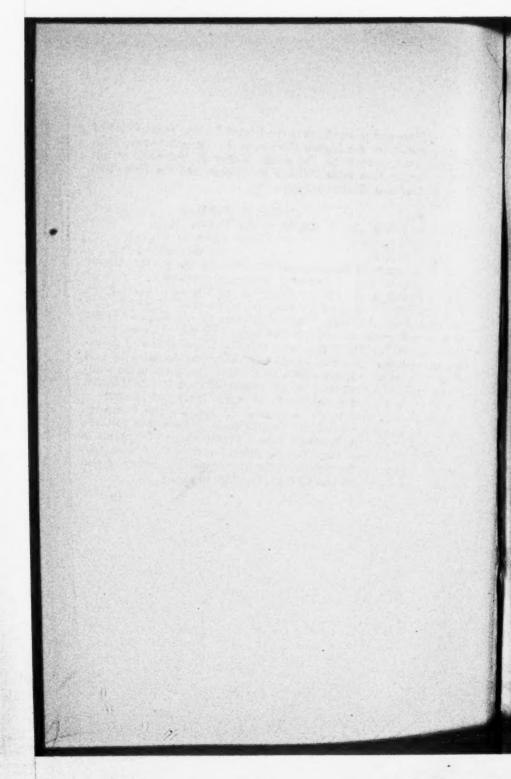
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Appeals for the Eighth Circuit, at the December term, 1912, of said court, before the Honorable Walter H. Sanborn, circuit judge, and the Honorable William H. Munger and the Honorable John A. Marshall, district judges.

Attest:

Seal JOHN D. JORDAN,
United States Circuit
Court of Appeals
Eighth Circuit
Circuit
Court of Appeals
For the Eighth Circuit.

Be it remembered that heretofore, to wit, on the seventh day of January, A. D. 1911, a transcript of record, pursuant to a writ of error directed to the District Court of the United States for the Western District of Missouri, was filed in the office of the clerk of the United States Circuit Court of Appeals for the Eighth Circuit in a certain cause wherein the Lexington Mill and Elevator Company, claimant, is plaintiff in error and The United States of America is defendant in error, which said cause was docketed in said Circuit Court of Appeals as No. 3533, which also contains an additional transcript, pursuant to an appeal allowed by the District Court of the United States for the Western District of Missouri in a certain cause, wherein the Lexington Mill and Elevator Company, claimant, is appellant, and The United States of America is appellee, which said cause was docketed in said Circuit Court of Appeals as No. 3534, which said transcript, as printed pursuant to the stipulation of the parties for the use of the court upon the hearing of said causes, is in the words and figures following, to wit:



a United States Circuit Court of Appeals for the Eighth Circuit.

Lexington Mill & Elevator Company, Claimant, Plaintiff in Error,

No. 3533. vs. United States of America, Defendant in Error,

### And

Lexington Mill & Elevator Company, Claimant, Appellant, No. 3534. vs. United States of America, Appellee.

### Stipulation,

Whereas, the record proper in the above entitled causes contains a copy of the motion for new trial; motion in arrest of judgment, notice of writ of error and appeal; order as to time for presenting motions for new trial and in arrest of judgment; affidavits in support of motion for new trial; stipulation to destroy perishable exhibits, etc.; order extending time for hearing on motion for new trial, etc.; consent of libellant to modification of judgment, etc.; and objections of libellant to settlement of bill of exceptions.

And Whereas, each of the above mentioned matters appears in full in the bill of exceptions, which is a part of the transcript.

Therefore, it is now here stipulated and agreed for the purpose of avoiding duplication, that the foregoing matters shall be printed where they appear in the bill of exceptions, but shall be omitted where they appear at pages sixty-two to one hundred and twenty, inclusive, of the transcript.

E. L. SCARRITT, Of counsel for plaintiff in error, and appellant.

> LESLIE J. LYONS, United States Attorney.

No. 3533. Lexington Mill and Elevator Co., Claimant, Plaintiff in Error, vs. United States of America. No. 3534. Lexington Mill and Elevator Co., Claimant, Appellant, vs. United States of America. Stipulation to omit certain portion of transcript of record from printed record. Filed Jan. 18, 1911.

John D. Jordan, Clerk.

### Citation.

In the United States District Court for the Western Division of the Western District of Missouri.

> United States of America, No. 285. vs.

Six Hundred and Twenty-five (625) Sacks of Flour, Lexington Mill & Elevator Company, Claimant.

United States of America-sct.

To the United States of America, Mr. Pierce Butler, Special Counsel, and Mr. Leslie J. Lyons, District Attorney— Greeting:

You, and each of you, are hereby cited and admonished to be and appear in the United States Circuit Court of Appeals for the Eighth Circuit at the City of St. Louis, Missouri, sixty days from and after the day this citation bears date, pursuant to a writ of error filed in the Clerk's office of the District Court of the United States for the Western Division of the Western District of Missouri, wherein the Lexington Mill and Elevator Company, a corporation, claimant and defendant in the above entitled cause, is plaintiff in error, and you are defendants in error, to show cause, if any there be, why the judgment and decree rendered against the said plaintiff in error and its property, as in said writ of error mentioned, should not be corrected, and why speedy justice should not be done the parties in that behalf.

Witness the Honorable Smith McPherson, Judge of the District Court of the United States for the Western Division of the Western District of Missouri, this 11th day of November, in the year of Our Lord, 1910.

SMITH McPHERSON, Judge.

d Service of the within citation accepted, this November 11th, 1910.

PIERCE BUTLER, LESLIE J. LYONS,

United States Attorney and Special Asst. Atty. General.

Approved and allowed: SMITH MCPHERSON, Judge.

No. 285. United States of America vs. Six Hundred Twentyfive Sacks of Flour, Lexington Mill & Elevator Co. Filed Nov. 11, 1910. Howard N. McCreary, Clerk. Scarritt, Scarritt, & Jones, Attorneys at Law, Scarritt Bldg., Kansas City, Mo. United States of America—sct.

The President of the United States of America to the Honorable Judge of the District Court of the United States for the Western Division of the Western District of Missouri—Greeting:

Because, in the records and proceedings, as also in the rendition of the judgment of a plea which is in the said District Court before you, at the April Term, 1910, thereof, between United States of America and Six hundred and twenty-five (625) sacks of flour and the Lexington Mill and Elevator Company (a Corporation), Claimant and defendant, a manifest error hath happened, to the great damage of the said flour and to the said Claimant and defendant Lexington Mill and Elevator Company, as by its complaint appears.

We being willing that error, if any hath been, should be duly corrected, and full and speedy justice done to the parties aforesaid in this behalf, do command you, if judgment be therein given, that then, under your seal, distinctly and openly, you send the record and proceedings aforesaid, with all things concerning the same, to the United States Circuit Court of Appeals, for the Eighth Circuit, together with this writ, so that you have the said record and proceedings aforesaid at the City of St. Louis, Missouri, and filed in the office of the Clerk of the United States Circuit Court of Appeals. for the Eighth Circuit, on or before the tenth day of January, 1911, to the end that the record and proceedings aforesaid being inspected, the United States Circuit Court of Appeals may cause further to be done therein to correct that error, what of right, and according to the laws and customs of the United States, should be done.

Witness, The Honorable John M. Harlan, Senior Associate

Justice of the Supreme Court of the United States, and
the seal of the Circuit Court of the Western Division of
the Western District of Missouri.

Seal
U. S. Circuit Court
Western Division
Western District
Missouri.

Issued at office in Kansas City, this 11th day of November, in the year of our Lord one thousand nine hundred and ten.

> ADELAIDE UTTER, Clerk of the Circuit Court of the United States for the Western Division of the Western District of Missouri.

Allowed by SMITH McPHERSON, Judge.

United States of America, Western Division of the Western District of Missouri—sct.

In obedience to the command of the within Writ, I herewith transmit to the United States Circuit Court of Appeals, a duly certified transcript of the record and proceedings in the within entitled case, and with all things concerning the same, except exhibits heretofore destroyed by stipulation and order of court.

In Witness Whereof, I hereto subscribe my name and affix the seal of said District Court of the United States for the Western Division of the Western District of Missouri.

Issued at office in Kansas City, this 6th day of January, A. D. 1911.

Seal
U. S. District Court
Western Division
Western District
Missouri.

HOWARD N. McCREARY,
Clerk.
By ..... D. C.

United States District Court, Western District of Missouri, Western Division. United States of America, vs. Six hundred twenty five sacks of flour, Lexington Mill & Elevator Company, Claimant and defendant. Writ of Error. Filed November 11th, 1910. Howard N. McCreary, Clerk.

Citation.

In the United States District Court for the Western Division of the Western District of Missouri.

United States of America, No. 285. vs. Six Hundred and Twenty-five (625) Sacks of Flour.

Lexington Mill & Elevator Company, Claimant.

United States of America, -Sct.

The President of the United States to United States of America, and to Mr. Pierce Butler, Special Counsel, and Mr. Leslie J. Lyons, United States District Attorney,—Greeting:

You and each of you are hereby cited and admonished to be and appear at the United States Circuit Court of Appeals for the Eighth Circuit at the City of St. Louis, Missouri, sixty days from and after the day this citation bears date, pursuant to an order allowing an appeal duly entered, filed and of record in the Clerk's office of the District Court of the United States for the Western Division of the Western District of Missouri, wherein Lexington Mill & Elevator Company is appellant, and you are appellee, to show cause, if any there be, why the decree and judgment rendered against the said appellant as in said appeal and in the said order allowing said appeal mentioned should not be corrected and why speedy justice should not be done to the parties in that behalf.

Witness the Honorable Judge of the District Court of the United States for the Western Division of the Western District of Missouri this 17th day of December in the year of our Lord, 1910.

ARBA 8. VAN VALKENBURGH, Judge. SMITH McPHERSON, Judge.

g We hereby acknowledge due service of the within citation this 17th day of December, 1910.

> PIERCE BUTLER and LESLIE J. LYONS, Attorneys for Libellant and Appellee.

No. 285. United States of America, vs. Six Hundred and Twenty-Five Sacks of Flour. Lexington Mill & Elevator Co. Claimant. Citation. Filed Dec. 17, 1910, Howard N. McCreery, Clerk. Scarritt, Scarritt & Jones, Attorneys at law.

h In the United States District Court for the Western Division of the Western District of Missouri,

United States of America, No. 285. vs. Six Hundred and Twenty-five (625) Sacks of Flour.

Lexington Mill & Elevator Company, Claimant.

Order Allowing Appeal.

On this 17th day of December, 1910, upon the petition for appeal of claimant and appellant, Lexington Mill & Elevator Company, and application therefor, with assignment of errors filed therewith, on this day, praying for the allowance of an appeal in the above entitled cause to the United States Circuit Court of Appeals for the Eighth Circuit, all parties appearing by their respective attorneys, and it appearing to the court that said appellant has filed on November 11, 1910, its assignment of errors as required by the rules of the Circuit Court of Appeals for the Eighth Circuit, and has duly served and filed notice of appeal herein.

It is ordered that the said appeal be and the same is allowed as prayed for, and it is further ordered that a supersedeas bond on said appeal be and the same is hereby fixed in the sum of \$2500.00; which said bond is now filed, signed by said appellant Lexington Mill & Elevator Company as principal, and America Surety Company of New York, a surety company, as surety; which bond and surety are now approved by the court and said bond is ordered to be filed and made a part of the record in this cause, and it is further ordered that the said bond shall operate and be a supersedeas bond and shall stay all further proceedings with reference to the judgment and decree in this cause

with reference to the judgment and decree in this cause during the pendency of this appeal in the United States Circuit Court of Appeals for the Eighth Judicial Circuit.

And it is ordered that a writ of citation issue in accordance with the allowance of this appeal, which said citation is now and here issued. Thereupon the said claimant and defendant and appellant, Lexington Mill & Elevator Company, files and duly serves in open court the libellant and its attorneys with the citation herein allowed and ordered, which citation is duly accepted by said libellant and its attorneys.

Dated 17th, 1910.

## SMITH McPHERSON, ARBA S. VAN VALKENBURGH, Judges.

## ,1 United States of America-sct.

Be It Remembered, That heretofore, to-wit, at the regular November Term of the United States District Court for the Western Division of the Western District of Missouri, and on the 9th day of April, 1910, the following entry appears of record, to-wit:

United States

No. 285. vs. Six Hundred Twenty-five Sacks of Flour.

This day comes A. S. Van Valkenburgh, United States District Attorney, who prosecutes on behalf of the United States, and by leave of Court files a libel herein, whereupon a warrant of seizure is issued and delivered to the Marshal, returnable on the 30th day of April, 1910, at ten o'clock in the fore-

Said Libel, filed April 9th, 1910, is in words and figures as follows, to-wit:

2 In the District Court of the United States for the Western Division of the Western District of Missouri.

## United States of America

VS.

Six Hundred and Twenty-five (625) Sacks of Flour.

The United States of America, by Arba S. Van Valkenburgh, United States Attorney for the Western District of Missouri, who prosecutes for and on behalf of the United States of America, hereby gives the court to understand and be informed that there are now in the possession of and held by B. O. Terry, of Castle, Sullivan County, Missouri, certain original unbroken packages and sacks each containing forty-eight (48) pounds more or less of flour; that said flour so contained in said packages and sacks is adulterated within the meaning of the Act approved June 30, 1906, entitled "An Act for preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes."

And the United States Attorney aforesaid, further gives the court to understand and be informed that said packages and sacks of flour consist of six hundred and twenty-five (625) sacks or packages, each containing forty-eight (48) pounds more or less of flour, branded and labeled as follows, to-wit: L 48 Pounds Lexington Cream X X X X X Fancy Patent. This Flour is Made of Finest Quality Hard Wheat. Lexington Cream. Lexington, Nebraska, Lexington Mill and Elevator Company", and were received by the said B. O. Terry, as aforesaid, on or about the 7th day of April, A. D. 1910, from

the Lexington Mill and Elevator Company, a corporation duly organized and existing under and by virtue of law, and engaged in the manufacture and sale of flour and other food products at Lexington, in the State of Nebraska; that the same were sold and shipped to the said B. O. Terry, of Castle, Sullivan County, Missouri, by the said Lexington Mill and Elevator Company, a corporation as aforesaid, of Lexington, Nebraska, on or about the 1st day of April, A. D. 1910, and were sent by common carriers engaged in interstate commerce, to-wit, from Lexington, in the state of Nebraska, to Council Bluffs, in the State of Iowa, over the Union Pacific Railway Company, and by it delivered to the Chicago, Burlington & Quincy Railroad Company at Council Bluffs, Iowa, and by it carried to Osborn, in the State of Missouri, and there delivered to the Quincy, Omaha and Kansas City Railroad Company, from which point said Quincy, Omaha and Kansas City Railroad Company transported said shipment to Castle, Sullivan County, Missouri, and there delivered the same to the said B. O. Terry; that all of said railroads are

common carrier corporations engaged in interstate commerce between the States of Nebraska, Iowa and Missouri, and among the other states and territories of the United States.

The United States Attorney aforesaid, further gives the court to understand and be informed that the flour so contained in said packages and sacks as aforesaid was and is adulterated in the following manner, to-wit:

- (a) That said flour was and is mixed and packed with another substance, to-wit, peroxide of nitrogen, so as to reduce and lower and injuriously affect its quality and strength.
- (b) That said flour was and is mixed, colored and stained with another substance, to-wit, peroxide of nitrogen in a manner whereby damage and inferiority was and is concealed.
- (c) That said flour contains an added poisonous substance and added deleterious ingredient, to-wit, peroxide of nitrogen, which rendered and renders said flour injurious to health
- (d) That said flour was subjected to a treatment whereby said peroxide of nitrogen was mixed and packed in and added to said flour in such a manner as to render said flour deleterious to health; that the said adulteration of said flour in the manner and by the method aforesaid was designed and intended to defraud and deceive, as aforesaid, and constitutes an adulteration of the contents of said packages and sacks, as aforesaid, in violation of said law.

Wherefore, it is prayed that process issue and that the United States Marshal of this district be commanded by order of this court to seize the packages and sacks of flour aforesaid for confiscation, destruction or sale, and the same hold to be dealt with as this Honorable Court may order and determine.

> A. S. VAN VALKENBURGH, United States Attorney.

On the said 9th day of April, 1910, the following order appears of record, to-wit:

In the District Court of the United States for the Western Division of the Western District of Missouri.

United States of America

VI

Six Hundred and Twenty-five (625) Sacks of Flour.

### Order.

Now on this day comes A. S. Van Valkenburgh, United States Attorney, for the Western District of Missouri, and presents to the Court an information and complaint of the United States against Six Hundred and Twenty-five (625) Sacks of Flour, property therein described, and now in the possession of B. O. Terry, of Castle, Sullivan County, Missouri, praying that the said goods may be seized for confiscation, destruction or sale and may be held to be dealt with as this court may order and determine, and that the usual process and monition of the court in that behalf be made,—

And the Court having considered said complaint and application and being fully advised in the premises, doth order that so much of the said goods as may still be in the original packages charged to have been adulterated shall be seized by the Marshal of this district and that the usual process and monition of the court be issued by the Clerk of this court for the Western Division of the Western District of Missouri, and that the Marshal of this court shall publish a citation giving notice generally unto all persons having or pretending to have any right, title or interest in said property to appear before this court in the city of Kansas City, Jackson County,

Missouri, in said Division and District, on the 30th day of April, next, if it be a court day, or else on the next court day thereafter, at ten o'clock in the forenoon of said day, then and there to make known their claims and allegations in said matter, and that the said Marshal publish said citation for at least fifteen (15) days, exclusive of Sundays, prior to said return day in the Kansas City Journal, a daily newspaper published and printed in Kansas City, Missouri, aforesaid, and within the Division and District in which said property is situated.

JNO. F. PHILIPS, Judge.

Kansas City, Missouri, April 9, 1910.

7 The Warrant issued by the Clerk of said Court, April 9th, 1910, is in words and figures as follows, to-wit:

In the District Court of the United States for the Western Division of the Western District of Missouri.

## United States of America

VS.

Six Hundred and Twenty-five (625) Sacks of Flour.

The President of the United States of America to the Marshal of the Western District of Missouri—Greeting:

Whereas, an information has been filed in the District Court of the United States for the Western Division of the Western District of Missouri, on the 9th day of April, A. D. 1910, by A. S. Van Valkenburgh, United States Attorney for the Western District of Missouri, on behalf of the United States of America, against certain property, goods, wares, and merchandise, to-wit: Six Hundred and Twenty-five (625) Sacks of Flour, each containing 48 pounds, more or less, for the reasons and causes in said information mentioned, and praying the usual process and monition of the said court in that behalf to be made, and that all persons interested in the said property may be cited in general and special to answer the premises, and all proceedings being had that said property may for the causes in said information mentioned be condemned, destroyed, and dealt with according to law,—

You are, therefore, hereby commanded to attach the said property and to detain the same in your custody until the further order of the court respecting the same and to give due notice to all persons claiming the same, or owning or having anything to say why the same should not be confiscated, destroyed or sold pursuant to the prayer of said information, that they be and appear before the said court to be held in and for the Western Division of the Western District of Missouri, 25th day of April, A. D. 1910, at ten o'clock in the forenoon of the same day, if the same shall be a day of jurisdic-

tion, otherwise on the next day of jurisdiction there8 after, then and there to interpose a claim for the same,
and to make all allegations in that behalf, and what you
shall have done in the premises do you then and there make
return thereof, together with this writ.

Witness the Honorable John F. Philips, Judge of said Court, and the seal thereof hereto affixed, at Kansas City, in said District, on the 9th day of April, A. D. 1910.

(Seal) HOWARD N. McCREARY, Clerk.

On the 12th day of April, 1910, the said Warrant was returned by the Marshal with his return thereon, in words and figures as follows, to-wit:

I executed the within warrant in Green Castle, Sullivan County, Missouri, on April 11, 1910, by seizing 597 sacks of flour as within described and storing them subject to the further order of the Court.

All done in the Western Division of the Western District of Missouri.

E. R. DURHAM, U. S. Marshal. By H. C. Miller, Deputy.

Marshal's	8	e	e	8						
1 service								4		2.00
Expenses										10.30
Total										\$12.30

On the 18th day of May, 1910, the Demand of Claimant for Jury is filed and is in words and figures as follows, to-wit:

In the District Court of the United States, for the Western Division of the Western District of the State of Missouri.

United States of America, Libellant, vs.

Six Hundred Twenty-five Sacks of Flour.

Demand for Jury.

To the Honorable, the Judge of the District Court of the United States, for the Western District of the State of Missouri:

Comes now the Lexington Mill & Elevator Company, claimant and answering defendant herein, and files this its demand for a jury to try the issues of fact in the above entitled cause.

## LEXINGTON MILL & ELEVATOR COMPANY,

By Ed. P. Smith, Bruce S. Elliott, Its Attorneys.

On the 19th day of May, 1910, the following entry appears of record, to-wit:

United States

No. 285. vs. Six Hundred and Twenty-five Sacks of Flour.

This day comes A. S. Van Valkenburgh, United States Attorney, and by leave of Court files an amended libel in this cause.

Said Amended Libel, filed May 19th, 1910, is in words and figures as follows, to-wit:

In the District Court of the United States for the Western Division of the Western District of Missouri.

United States of America,

VS.

Six Hundred and Twenty-five (625) Sacks of Flour.

## Amended Libel.

The United States of America, by Arba S. Van Valkenburgh, United States Attorney for the Western District of Missouri, who prosecutes for and on behalf of the United States of America, hereby gives the court to understand and be informed that there are now in the possession of and held by B. O. Terry, of Castle, Sullivan County, Missouri, certain original unbroken packages and sacks each containing forty-eight (48) pounds more or less of flour; that said flour so contained in said packages and sacks is adulterated within the meaning of the Act approved June 30, 1906, entitled "An Act for preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes."

18 And the United States Attorney aforesaid, further gives the court to understand and be informed that said packages and sacks of flour consist of six hundred and twenty-five (625) sacks or packages, each containing forty-eight pounds more or less of flour, branded and labeled as follows, to-wit: "L 48 Pounds Lexington Cream X X X X X Fancy Patent. This Flour is Made of First Quality Hard Wheat. Lexington Cream. Lexington, Nebraska, Lexington Mill and Elevator Company", and were received by the said B. O. Terry, as aforesaid, on or about the 7th day of April, A. D. 1910, from the Lexington Mill and Elevator Company, a corporation duly organized and existing under and by virtue of law, and engaged in the manufacture and sale of flour and other food products at Lexington, in the State of Nebraska; that same were sold and shipped to the said B. O. Terry, of Castle, Sullivan County, Missouri, by the said Lexington Mill Elevator Company, a corporation as aforesaid, of Lexington. Nebraska, on or about the 1st day of April, A. D. 1910, and were sent by common carriers engaged in interstate commerce, to-wit, from Lexington, in the State of Nebraska, to Council Bluffs, in the State of Iowa, over the Union Pacific Railway Company, and by it delivered to the Chicago, Burlington & Quincy Railroad Company at Council Bluffs, Iowa, and by it carried to Osborn, in the State of Missouri, and there delivered to the Quincy, Omaha, and Kansas City Railroad Company, from which point said Quincy, Omaha and Kansas City Railroad Company transported said shipment to Castle, Sullivan County, Missouri, and there delivered the same to the said B. O. Terry; that all of said railroads are common carrier corporations engaged in interstate commerce between the States of Nebraska, Iowa, and Missouri, and among the other states and territories of the United States.

The United States Attorney aforesaid further gives the Court to understand and be informed that the flour so contained in said packages and sacks as aforesaid was treated by a process for the bleaching of flour known as the Alsop Process, which

- said process consists of the generation by means of electricity of nitrogen peroxide gas, which is mixed with atmospheric air, and the mixture brought into contact with the flour; and your libelant charges that by this treatment the flour contained in said six hundred and twenty-five (625) sacks, and each and every part thereof, has been caused to be adulterated within the meaning of the Act of Congress, in the following manner and particulars, to-wit:
- (a) In that a substance known as nitrites or nitrite reacting material has been mixed and packed with the said flour so as to reduce and lower and injuriously affect its quality and strength, in these respects, among others, namely: That the capacity of the said flour to change and improve, as it would have changed and improved if aged and conditioned by natural processes, has been destroyed; that by direct action the elasticity of the gluten has been lessened and impaired, so as to injuriously affect the bread-making qualities of the flour; that by direct action other ingredients of the said flour have been injurously affected, so as to reduce, lower and impair its bread-making qualities.
- (b) In that by the treatment as aforesaid the said flour has been mixed, colored and stained in a manner whereby damage and inferiority is concealed in these respects, among others, namely: That the inferiority of freshness or newness [as] inferiority which is present in flour made from new wheat or in flour freshly milled from wheat that is either old or new, and an inferiority which manifests itself, among other things, in inferiorities of color, of elasticity of gluten, and of the quality of other ingredients which affect its value for bread-making purposes, is thereby concealed; and that said flour has been caused to simulate the appearance of flour made from wheat which has been properly aged and conditioned by natural processes and of flour which has been properly aged and conditioned by natural processes, after being milled from wheat that is either old or new; and this treatment by the Alsop Process, as aforesaid, has concealed the inferiority of said flour, and has

given it the appearance of a better grade of flour than it really is.

And further, that the flour contained in said six hundred and twenty-five (625) sacks, and treated by the Alsop Process as aforesaid, was when milled, and now is, of a grade of flour inferior to a patent flour, and was when milled, and now is, of a grade of flour inferior to the grade known as finest quality of hard wheat; and that the said flour, inferior in these respects, has been caused to have the appearance of a patent flour and of flour made from the finest quality of hard wheat,

20

and thereby the inferiority contained in said flour was and is concealed, and in other respects also the inferiority of said flour was and is concealed.

(c) In that by the treatment as aforesaid the said flour has been caused to contain added poisonous or other added deleterious ingredients, to-wit, nitrites or nitrite re-acting material, nitrogen peroxide, nitrous acid, nitric acid and other poisonous and deleterious substances, which may render said flour injurious to the health.

The United States Attorney aforesaid further gives the Court to understand and be informed that the flour contained in the aforesaid packages and sacks was and is misbranded within the meaning and intent of the act of Congress of June 30, 1906, in the following manner and particulars, to-wit:

(a) First, in this, that the packages and sacks containing such flour were labeled as aforesaid, "L. 48 Pounds, Lexington Cream X X X X Fancy Patent. This Flour is made of first quality hard wheat. Lexington Cream. Lexington, Nebraska, Lexington Mill and Elevator Company"; that in truth and in fact a patent flour is and is known and recognized to be the best grade of flour, and consists only of that portion of the flour content of the wheat known as the middlings; and your libelant charges that the flour, contained in said sacks is not a patent flour, but is a grade and quality of flour inferior to a patent flour, being a mixture of the middlings, together with a commercially inferior grade of flour, and a flour which

21 before bleaching was darker in color than a patent flour, and inferior in grade, quality and strength to a patent flour, and that this mixture shipped into Missouri and labeled as aforesaid was sold under the distinctive name of another article than itself, and was labeled as aforesaid so as to deceive and mislead the purchaser, in the respect that it purported to be a patent flour, whereas in truth and in fact it was not a patent flour.

(b) Second, in this, that the sacks containing said flour were labeled as aforesaid, "L. 48 Pounds. Lexington Cream X X X X Fancy Patent. This flour is made of first quality hard wheat. Lexington Cream. Lexington, Nebraska, Lexington Mill and Elevator Company," whereas in truth and in fact the said flour was not made of finest quality of hard wheat, but was milled, in whole or in part, from a grade or grades of soft wheat, and that the flour thus labeled as aforesaid, "This Flour is made of first quality hard wheat" was sold under the distinctive name of another article than itself; that it purported to be made from the first quality of hard wheat, where-

as in truth and in fact it was made in whole or in part of soft wheat, and, therefore, was sold under the distinctive name of another article than itself, and misbranded within the meaning and intent of the Act of Congress.

Wherefore, it is prayed that process issue and that the United States Marshal of this district be commanded by order of this court to seize the packages and sacks of flour aforesaid for confiscation, destruction or sale, and the same hold to be dealt with as this Honorable Court may order and determine.

> A. S. VAN VALKENBURGH, United States Attorney.

On the said 31st day of May, 1910, the Answer of The Lexington Mill & Elevator Company to the Amended Libel, is filed and is in words and figures as follows, to-wit:

In the District Court of the United States for the Western Division of the Western District of Missouri.

United States of America, Libellant,

625 Sacks of Flour.

Answer of The Lexington Mill & Elevator Company to the Amended Libel.

To the Honorable, the Judge of the District Court of the United States for the Western Division of the Western District of Missouri:

Comes now the Lexington Mill & Elevator Company, a corporation organized under the laws of the State of Nebraska, and a citizen and resident of the State of Nebraska, and shows to the Court:

- 1. That it is interested in the property seized under the writ issued in this cause, to-wit, six hundred and twenty-five sacks of flour, more or less, which interest is more fully set forth hereafter, and it prays that it may be made a defendant in this cause and permitted to defend against the seizure, forfeiture and condemnation of said merchandise.
- 2. This claimant shows to the court that it manufactured said flour at its mill in the City of Lexington, State of Nebraska, and sold the same to B. O. Terry of Castle, in the State of Missouri, and caused said flour to be shipped from the City of Lexington, in the State of Nebraska to the said B. O. Terry at Castle in the State of Missouri; that said flour was sold by said Lexington Mill & Elevator Company under a guar-

antee that the same was not adulterated within the meaning of the Act of Congress known as the Food and Drug Act of June 30, 1906; that this defendant did not receive pay for said

flour, and after the seizure of said flour by the process issued in this cause this defendant was required to and did furnish to the said B. O. Terry other flour in lieu of that seized in this cause, by reason whereof the flour seized in this cause has become and is the flour of this answering defendant; and if said flour is by the order and judgment of this court seized, forfeited and condemned this answering defendant will suffer loss to the extent of the price and value of said flour, to-wit, the sum of Seven Hundred and Fifty Dollars.

- This answering defendant admits that said flour was manufactured and shipped from the State of Nebraska into the State of Missouri by the lines of railroad set forth and described in the amended libel herein.
- This answering defendant admits that said sacks and each of them were branded and labeled as described in the amended libel, except that instead of being branded "This flour is made of finest quality hard wheat," the said sacks were branded, "This flour is made from first quality hard wheat."
- 5. This answering defendant admits that the flour so contained in said packages and sacks were treated by a process known as the Alsop Process, but this defendant denies that said sacks or the contents thereof, or any portion thereof, has been caused to be adulterated within the meaning of the act of Congress as alleged in said amended libel. This defendant denies that a substance known as nitrites or nitrite reacting material has been mixed or packed with said flour, or any part thereof, so as to reduce or lower or injuriously affect its quality or strength in any respect whatsoever. This defendant denies that by said treatment said flour has been mixed, colored or stained in any manner whereby damage or inferiority is concealed in any respect whatsoever. It denies that said flour, or any part thereof, has been so treated, or has been treated in any manner whereby the grade or quality of said flour, or any part thereof, has been concealed, and denies that by such treatment the said flour, or any part there-

of, has been given an appearance of a better grade of

flour than it really is, 26

6. This defendant denies that the said flour, or any part thereof, is inferior to a patent flour, and denies that the same, or any part thereof, was when milled, or now is, of a grade of flour inferior to a grade of flour known as the finest quality of hard wheat, and denies that the quality of said flour, or of the wheat from which it was made has been in any manner concealed. This defendant denies that by the treatment of said flour, the same, or any portion thereof, has been caused to contain any added poisonous or other deleterious ingredients, which may render said flour injurious to health.

- This defendant admits that said sacks containing said flour were labeled as alleged in said libel, except that the same was labeled as being made from first quality hard wheat instead of being labeled made of the finest quality of hard wheat. This defendant denies that the so-called patent flour is known or recognized to be a grade of flour consisting only of that portion of the content of the wheat known as middlings, and says it is not true that the flour contained in said sacks is not a patent flour, or that it is of a grade or quality inferior to a patent flour, or that it is a mixture of middlings together with a commercially inferior grade of flour, or of a flour which was at any time of a color darker than a patent flour or inferior in grade, or quality or strength to a patent flour, and this defendant denies that the same has been mixed and shipped into the State of Missouri and sold under a distinctive name of another article than it is, or that the same was labeled in any manner so as to deceive or mislead the purchaser, or that it did deceive or mislead the purchaser in any respect whatsoever.
- 8. This defendant admits that said sacks were labeled showing that the said flour was made of the first quality of hard wheat, and this defendant alleges that the same was made from the first quality of hard wheat, and denies that the same was made in whole or in part from a grade or grades of soft wheat, and that it was sold under a name of any article different from what it really was, or that the same was in any respect misbranded.
- 10. Further answering said amended libel this defendant admits that said flour has been treated by the Alsop process, and in this connection alleges that the process by which it has thus been treated consists of generating in rapid succession a flaming electric discharge in a current of air in proximity to such electric discharge, and in conducting the air as modified by such discharge into the presence of the flour as it is being continuously passed through a revolving reel or agitator, but this defendant denies that the flour thus treated is in any way adulterated or that by said process any poisonous or other deleterious ingredient is in any manner added thereto, or imparted thereto, or that the flour thus treated is in any way

injurious to health or contains any added deleterious ingredient or that the same is in any manner adulterated or that by such process any damage or inferiorty in said flour is in any manner concealed or that the quality or strength of said flour is in any manner affected, reduced or lowered.

11. Further answering said complaint and libel this defendant and claimant states that it is informed and believes, and therefore avers, that this court is without right authority of law and the officers of this court are without right or authority of law to seize the flour so manufactured and shipped into interstate commerce by this claimant, for the reason that the Food and Drug Act of June 30th, 1906, under which pretended authority is exercised and under which the seizure of the flour in controversy herein was made, is wholly invalid, unconstitutional and void, in that it deprives this answering claimant of its property without due process of law, and is in violation of Artical 1, Section 8, Paragraph 3 of the Constitution of the United States giving to Congress the right to regulate commerce among the several states, and is in violation of Article 10 of the Amendments to the Constitition of the United States which provides that-

28 "Powers not delegated to the United States by the Constitution nor prohibited by it to the states, are reserved to the state, respectively, or to the people."

And this answering claimant further shows to the Court that it is informed and believes, and therefore so avers, that the said Act known as the Food and Drug Act of June 30th, 1906, is wholly illegal and void, for the reason that said Act is uncertain and indefinite, particularly in this, that said law does not define any standard of grade, quality or purity, and in this regard delegates legislative functions to the courts clothed with jurisdiction of cases of a civil or criminal nature brought under said law in violation of Article 1 of the Constitution of the United States providing that—

"All legislative powers herein granted shall be vested in a congress of the United States, which shall consist of a senate and house of representatives."

Wherefore, having fully answered, this claimant asks that said complaint and libel be dismissed, that said flour seized under the writ issued by this court be released and restored, and for such further and different relief as may be just in the premises, and that this defendant and claimant may recover its costs herein expended.

LEXINGTON MILL & ELEVATOR COMPANY,

By E. L. Scarritt,

BRUCE S. ELLIOTT,

ED. P. SMITH,

Its Attorneys.

State of Missouri, County of Jackson—ss.

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E. M. F. Leflang, being first duly sworn, deposes and says that he is the president of the Lexington Mill & Elevator Company, a corporation; that he has heard read the foregoing answer and the statements therein contained are true as he verily believes.

E. M. F. LEFLANG.

Subscribed in my presence and sworn to before me this 31st day of May, 1910.

HOWARD N. McCREARY, U. S. District Clerk.

29 On the 1st day of June, 1910, the Reply of the United States to the Answer of Claimant to the Amended Libel was filed and is in words and figures as follows, to-wit:

In the District Court of the United States for the Western Division of the Western District of Missouri.

United States of America, No. 285. vs. Six Hundred and Twenty-five (625) Sacks of Flour.

## Reply.

Now on this 1st day of June, 1910, comes Pierce Butler, Esq., Special Assistant Attorney General, and A. S. Van Valkenburgh, United States Attorney for the Western District of Missouri, on behalf of the United States of America, and for their reply to answer filed by the Lexington Mill and Elevator Company, claimant in the above entitled cause, state that they deny each and every allegation of new matter contained in said answer.

PIERCE BUTLER,
Special Assistant Attorney General.
A. S. VAN VALKENBURGH,
United States Attorney.

On the 1st day of June, 1910, the following entry appears of record, to-wit:

### United States

No. 285. vs.

Six Hundred and Twenty-five Sacks of Flour.

This day comes A. S. Van Valkenburgh, United States District Attorney and Pierce Butler on behalf of the United States, also comes the claimant the Lexington Mill and Elevator Company by its counsel E. P. Smith, Bruce Elliott, A. E. Helm and E. L. Scarritt, and this case coming on for trial it is ordered that a jury come, to-wit: W. F. Tuttle, John M. Ellis, Fielding Hudson, Henry C. Crow, John W. Thomason, Wm. R. Smith, Geo. W. Ragan, J. C. Graves, M. G. Harman, R. R. Jenkins, Thos. T. Arnett and H. C. Kellerman, twelve good and lawful men who are duly empaneled and sworn to well and truly try the issues joined, statements are made by counsel, and the hour of adjournment having arrived further proceedings are postponed until tomorrow merning.

57 On the 2nd day of July, 1910, the following entry appears of record, to-wit:

### United States

No. 285. vs.

Six Hundred and Twenty-five Sacks of Flour.

This day again come the parties to this cause, Leslie J. Lyons, United States District Attorney, and Pierce Butler, on behalf of the United States, also comes the Lexington Mill and Elevator Company, claimant herein, by its counsel Bruce Elliott, A. E. Helm and E. L. Scarritt, thereupon the matters pertaining to the courts charge and the law governing the issues in this case were argued and submitted to the court, and by the court taken under advisement.

58 On the 5th day of July, 1910, the following entry appears of record, to-wit:

## United States

No. 285. vs.

Six Hundred and Twenty-five Sacks of Flour.

This day again come the parties to this cause, Leslie J. Lyons, United States District Attorney, and Pierce Butler on behalf of the United States, also comes the Lexington Mill and Elevator Company, claimant herein, by its counsel Bruce Elliott, A. E. Helm, and E. L. Scarritt, and the jury sworn to try this case as on Friday last, arguments are made by counsel, thereupon the claimant presented in writing seventeen written requests to charge the jury, which requests were by

the court overruled, to which the claimant at the time in open court excepts, and after hearing the charge of the court the jury retire to consider what verdict they shall render in the premises, and not having reached a verdict at the hour of adjournment, it is ordered that the marshal furnish said jury with supper at the expense of the government, and that further consideration of this case be postponed until tomorrow morning.

On the 6th day of July, 1910, the following entry of the verdicts and judgment in this case appear of record, to-wit:

## United States

No. 285. vs. Six Hundred and Twenty-five Sacks of Flour.

This day again come the parties to this cause, Leslie J. Lyons, United States Attorney, and Pierce Butler, Esq., Special Assistant Attorney General, on behalf of the United States, also comes the Lexington Mill and Elevator Company, claimant herein by its counsel, Bruce S. Elliott, Judge A. E. Helm, and Judge E. L. Scarritt, and the jury sworn to try this case as on yesterday, and thereupon the jury came into court under the charge of the sworn bailiff and returned two verdicts signed by their foreman, which said verdicts are in words and figures following, to-wit:

"In the District Court of the United States, Western District of Missouri, Western Division.

United States of America No. 285. vs.

Six Hundred Twenty-five (625) Sacks of Flour, Lexington Mill and Elevator Company, Claimant.

### Verdict.

We, the jury, find that the flour seized in this case is adulterated.

July 6, 1910.

JOHN W. THOMASON, Foreman.

In the District Court of the United States, Western District of Missouri, Western Division.

United States of America No. 285. vs.

Six Hundred Twenty-five (625) Sacks of Flour, Lexington Mill and Elevator Company, Claimant.

### Verdict.

We, the jury, find that the flour seized in this case is misbranded.

July 6, 1910.

JOHN W. THOMASON, Foreman.'

and announced that the same are the verdicts of the jury.

Thereupon, the Court orders said two verdicts and each of them filed and recorded on the records of this court, which is accordingly done, to which the said claimant, the Lexington Mill and Elevator Company at the time in open court objects and excepts.

Thereupon, on motion of the United States Attorney it is ordered, considered and adjudged that the Lexington Mill and Elevator Company pay the taxable costs herein made to be taxed by the Clerk, for which a writ of execution will issue, to which ruling, order and judgment the said Claimant at the time in open court excepts.

It is further considered, ordered and adjudged that the flour seized herein and now in the possession of the United States Marshal for this District, be and the same is hereby condemned and confiscated to the United States of America, as being food adulterated and misbranded within the meaning of the Act of Congress approved June 30, 1906, and that all of the same be destroyed by the United States Marshal.

61 From the foregoing as to the confiscation and destruction is excepted the flour heretofore released by order of the court, to each, all and every of the foregoing orders, directions, judgment, and findings, the Claimant, the Lexington Mill and Elevator Company in open court excepts.

And said Claimant, the Lexington Mill and Elevator Company is given twenty (20) days from this date to file a motion for a new trial, or a motion to modify any or all of the foregoing, and a motion to vacate or set aside any or all of the foregoing, and by the word motion is meant to include any exceptions or objections to any of the foregoing, or all of the same; and also the right and privileges is hereby given to said Claimant to serve and file Bill of Exceptions or notice of appeal from any or all of said orders within the time allowed by statute and the rules of Court. No process or writ shall issue until the motion for new trial is ruled on, if filed within said 20 days.

SMITH McPHERSON, Judge.

121 On the 11th day of November, 1910, the following order was filed and entered of record, to-wit:

In the District Court of the United States for the Western Division of the Western District of Missouri.

### United States of America

VB.

625 Sacks of Flour. Lexington Mill & Elevator Company, Claimant.

#### Order.

On this 11th day of November, 1910, in open court, come the parties in the above entitled cause, by their respective attorneys, and the motion for a new trial herein heretofore filed by claimant, Lexington Mill & Elevator Company, is presented to the Court.

Thereupon the libellant, in writing filed herein, which writing is made a part of the bill of exceptions and records in this case, consented and prayed the Court that the judgment heretofore entered herein be modified as in said writing stated: that the claimant objected to libellant filing its said writing, or any writing, and objected to any modification of the judgment whatsoever, either as prayed by the libellant or otherwise; and the Court, in view of such objection on the part of the claimant, declines to modify the same as prayed by the libellant: and by said writing the libellant objected to the receiving in evidence the affidavits filed herein, namely, that certain affidavit of Bruce S. Elliott, A. E. Helm and E. L. Scarritt, that certain affidavit of juror Henry C. Crow, that certain affidavit of juror R. R. Jenkins, that certain affidavit of juror J. C. Graves, that certain affidavit of juror James T. Arnett, all bearing date of July 22, 1910, and filed herein, upon the ground

that the said affidavits are and each of them is incompetent, irrelevant and immaterial, and inadmissible to im-

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peach, modify, explain or define the verdicts and findings of the jury herein, and upon the ground and for the reason that the charge of the Court to the jury, herein, was wholly in writing, and was read in its entirety by the Court to the jury in open court and in the presence of counsel, after the Court had handed to counsels of the parties respectively, a complete copy of such charge, and for the reason that said written charge was immediately upon the completion of the reading thereof by the Court to the jury handed to the jury by the Court or under its direction, in open court, openly and in the presence of counsel for the parties, respectively; and for the reason that no objection thereto was made by counsel on either side, or by any other person; and libellant moved to strike all of the

said affidavits from the files; and the Court, having considered the same, sustained the objections of said libellant, to each of the said affidavits, and ordered that the same be stricken from the files herein; to which action of the Court in striking said affidavits from the files the claimant objected and excepted at the time, and still excepts, which exceptions are allowed.

And the Court having considered the claimant's motion for a new trial, and being duly advised thereon, doth overrule and deny said motion; to which action and ruling of the Court in overruling and denying said motion for a new trial, the claimant, at the time, duly excepted and still excepts, which exceptions are allowed.

Thereupon the motion in arrest of judgment heretofore filed herein by said claimant, being submitted to the Court, the Court having considered the same, and being duly advised thereon, doth overrule and deny said motion; to which action and ruling of the court in overruling and denying said motion in arrest of judgment the claimant duly excepted at the time

rest of judgment the claimant duly excepted at the tim
and still excepts, which exceptions are allowed.

Thereupon said claimant presents to the Court its bill of exceptions herein, preserving its exceptions to all actions, rulings, decisions, judgments and decrees of the Court had at and during the trial and progress of this cause.

Thereupon the libellant, in writing, presented to the Court certain objections, amendments and modifications to the bill of exceptions proposed by the claimant, which writing was on this day filed in court. The libellant withdrew the objections stated in the paragraph numbered (1) of said writing, which writing is included in the bill of exceptions herein. After due consideration, and the Court being fully advised thereon, the Court doth approve, sign, seal and allow the Bill of Exceptions, and hereby orders that the same be and is duly filed herein as a part of the record in this cause.

Thereupon the claimant herein files and presents to the Court its application for a writ of error herein to the United States Circuit Court of Appeals for the Eighth Judicial Circuit, and there is filed with said application for writ of error an assignment of errors, and also a bond in the sum of \$2,500.00, signed by claimant, Lexington Mill & Elevator Company, as principal, and the Bankers Surety Company of Cleveland, Ohio, a corporation, as surety. Therefore, it is ordered that said assignment of errors be and the same is hereby ordered filed as a part of the record herein, and that a writ of error is allowed in the above entitled cause to the United States Circuit Court of Appeals for the Eighth Judicial Circuit as prayed for in the

said application and that the bond presented herewith in the sum of \$2,500.00, signed by the claimant, Lexington Mill & Elevator Company, as principal, and the Bankers Surety Company, as surety, is approved and ordered to be filed and made

a part of the record in this cause; and it is further order-

d that the said bond shall operate and be a supersedeas bond and shall stay all further proceedings with reference to the judgment and decree in this cause during the pendency of this writ of error in the United States Circuit Court of Appeals for the Eighth Judicial Circuit, and that a writ of citation issue in accordance with the allowance of this writ of error, which said citation is now and here issued.

Thereupon the said claimant files and duly serves in open court the libellant and its attorneys with a citation herein allowed and ordered, which citation is duly accepted by said libellant and its attorneys.

SMITH McPHERSON, Judge.

125 The Bill of Exceptions, filed November 11, 1910, is in words and figures as follows, to-wit:

### Volume 1.

In the United States District Court for the Western Division of the Western District of Missouri.

United States of America, No. 285. vs.

Six Hundred and Twenty-five (625) sacks of Flour. Lexington Mill and Elevator Company, Claimant.

## Bill of Exceptions,

The above entitled cause on to be heard before Hon. Smith McPherson and a jury at Kansas City, Missouri, on Tuesday, May 31, 1910, at ten o'clock A. M. Mr. Pierce Butler, Special Counsel, and Mr. Leslie J. Lyons, Assistant District Attorney, appeared on behalf of the United States of America; and Messrs. Ed. P. Smith, Bruce S. Elliott, A. E. Helm and E. L. Scarritt appeared on behalf of the claimant and defendant, and the property seized.

Whereupon on said day the jury was impanelled and on the following day the opening statements of the respective counsel were heard, and thereafter, on Thursday, June 2, 1910, at ten o'clock A. M. of said day, the taking of testimony in the said cause was begun, and the following proceedings were had.

126 Thursday June 2nd, 1910.

At ten o'clock A. M. of the above day and date, Court met, pursuant to adjournment as hereinbefore set out.

The Court: Now, gentlemen, we have impaneled the jury, and we have heard the opening statements of what each side contends, and we are ready to put in this evidence. I do not desire to hurry either side, but I feel, now, we ought to get along. I am inclined to think that, after a day or two, when you gentlemen have had your consultations and little conferences with your witnesses that we ought to have somewhat longer court hours. I will not do that for a day or two until you have had the requisite conferences with your witnesses, especially your experts, but, after a day or two, I think we will have to have longer Court hours.

Counsel for the Government may proceed.

Mr. Lyons, you furnished me a few days ago a copy of this statute of June 30th, 1906, but it has been mislaid, or something and if you have an extra copy I will be glad to have it before me.

Mr. Butler: I think we have one.

(Document referred to produced, and handed to the Court)

The Court: You rely on paragraphs one, four and five of what sections?

Mr. Butler: Seven.

The Court: All right.

Mr. Butler: Government Exhibit "A" being a certified copy of letters patent to James N. Alsop, No. 759651 granted May 10th, 1904, for an improvement on process of bleaching flour, is offered in evidence.

Mr. Scarritt: How do you designate that Mr. Butler?

Mr. Butler: Government Exhibit A, Judge Scarritt.

The Court: I would suggest—I have found it most convenient, where there is likely to be a good many exhibits, to have the exhibits of the plaintiff numbered commencing with No. 1 and the defendant's exhibits commencing with No. 101, or 201, and then you will always know by the mere mentioning of an exhibit whose exhibit it is. I have found that in my practice. We will call this Exhibit 1 Mr. Reporter, and when we commence with the defendant we will say 201. Then we always know, immediately whose exhibit it is. When the defendant offers the first one that will be 201, and on up, and the government commencing with 1 on up.

Mr. Smith: The defendant objects to Exhibit 1 as incompetent, irrelevant, immaterial, and in no way tending to prove any of the issues in this case, and the defendant separately and specially objects to that part of said Exhibit No. 1 being the printed part, commencing with the words, "United States Patent Office. J. N. Alsop of Owensboro, Kentucky", and down to and including the remainder of the printed portion, as being incompetent, irrelevant and immaterial, and being statements made by a person not a party to the case, not made in the presence of this defendant, and is, in no wise, binding on this defendant.

The Court: Now, what is that printed matter, Mr. Smith?

Mr. Smith: Well, it is his description and his claim.

The Court: Well, the claims on which the patent was issued?

Mr. Smith: I don't know.

The Court: I assume so.

Mr. Smith: I assume so. I don't know it, but I assume so, and I further specifically object to that part of the printed portion, commencing on what is marked page 4, commencing with the words, "Having thus fully described my invention what I claim as new is," and from this down to and including

the words, "J. N. Alsop," for the reason that it is in-128 competent, irrelevant and immaterial being declarations made by a party not a party to this suit, not being made in the presence of the defendant, The Lexington Mill and

Elevator Company, and in no wise binding upon it.

The Court: The objection is overruled.

Claimant excepts.

The Court: Now, just a moment. I am not familiar with these terms. Let's see. You are a proctor,—not a lawyer, I believe?

Mr. Smith: Well, I should hate to have it told in Court I am not a lawyer. Maybe I am not. I hate to have you make it public.

The Court: Well, I mean all of you. I don't mean you individually. I mean Mr. Butler likewise.

Mr. Smith: Yes, I know what your Honor means.

The Court: Now, what is this party called,-the claimant?

Mr. Smith: Yes, the claimant,

Mr. Lyons: In the answer he asks to be made a defendant.

The Court: Well, "Claimant" I suppose is all right, and "Claimant excepts."

Mr. Smith: Yes.

The Court: I never tried an Admiralty case in my life.

Mr. Butler: Neither did I.

The Court: I see that.

Mr. Butler: Government's Exhibit 2 is offered in evidence. It'is a certified copy of letters patent of James N. Alsop, numbered 758883, granted May 3rd 1904, for improvements in methods of generating gaseous medium from air.

Mr. Smith: The whole Exhibit is objected to as incompetent, irrelevant and immaterial, and in no wise binding upon the defendants in this case, nor tending to prove any of the issues in this case, and especially we object to that part of it commencing with the words, "United States Patent Office,"

thence down to and including the words "J. N. Alsop", 129 for the reason it is incompetent, irrelevant and immaterial, not tending to prove any issue in this case, and being statements made by a party not a party to the record, not being made in the presence of the claimant, and in no wise binding upon it; and we specifically object to that part of it commencing on page 4 of the printed portion with the words, "Having thus fully described my invention, what I claim as new, and desire to secure by letters patent of the United States is," and from thence down to and including the words, "J. N. Alsop," as being incompetent, irrelevant and immaterial, statements made by one not a party to the record, and not made in the presence of the defendant, and in no wise binding upon it.

The Court: The objection overruled, and the claimants except.

Mr. Butler: Government's Exhibit 3 being a certified copy of Letters Patent to James N. Alsop, No. 758854, granted May 3rd, 1904, for improvements in apparatus for generating gaseous medium from air, is offered in evidence.

Mr. Smith: The whole exhibit is objected to as incompetent, irrelevant and immaterial, not tending to prove any issue in this cause, and specifically object to that portion of it commencing with the words "United States Patent Office", being the printed portion down to and including the words, "J. N. Alsop," for the reason that that portion is incompetent, irrelevant and immaterial, not tending to prove any issue in

this cause, and we specifically object to that part commencing with the word, on page 3 of the printed part, "Having thus fully described my invention, what I claim as new, and desire to secure by letters patent of the United States is," and from thence down to and including the signature, "James N. Alsop," as incompetent, irrelevant and immaterial, being statements made by persons not a party to the record, not being made in the presence of this claimant, and in no wise binding on it.

130 The Court: Objection overruled, and claimant excepts.

Mr. Butler: Mr. John Mitchell will be sworn.

John E. Mitchell, called as a witness on behalf of the government, being first duly sworn, testified as follows:

#### Direct Examination

By Mr. Butler:

Q. Mr. Mitchell, what is your business?

A. Manufacturing business.

Q. What line?

- A. Manufacture electrical and milling machinery especially,—
- Q. —Are you alone in the business, or are you connected with a company?

A. I am associated with two companies.

Q. What two companies?

A. The Mitchell-Parks Manufacturing Co. and the Alsop Process Company.

Q. The Alsop Process Company? A. Yes, sir.

Q. Are you an officer of that company?

A. I am general manager of that company; yes, sir.

Q. Are you an officer of the company,—president or secretary? A. No, I am not.

Q. You are in charge of its affairs? A. I am, yes, sir.

Q. And its principal managing officer or agent?

A. I am the manager; yes, sir.

Q. That company is associated in the defense of this suit, and employing counsel herein, is it?

Mr. Smith: I object to that as immaterial. Pardon me. 1 don't know what the rules of this court require; whether it requires counsel to stand when they examine witnesses and rise when they make objections?

The Court: I think so.

Mr. Smith: I will conform to that rule.

131 Mr. Butler: I am not in your way, am I?

Mr. Smith: Oh, no.

Mr. Butler: This is a very convenient place.

Mr. Smith: Yes, sir, that is all right.

The Court: He may answer.

A. We have an attorney here, yes, sir. Mr. Elliott represents us.

By Mr. Butler:

Q. Mr. Bruce S. Elliott, who is one of the attorneys of record is employed by your company to defend this case?

A. Not altogether.

Q. Associated with the other gentlemen here? A. We pay half of his—

Q. I don't care for that.

A. —the millers pay the other half.

Q. I hope that he is paid enough, but I merely wanted to show your connection,-the Alsop Process Company's connection with the case. Does the Alsop Process Company own the bleacher that bleached the flour that was seized?

A. Yes, sir, it does.

Q. That, I believe is located in the mill of the Wellington -is it?

Mr. Lyons: Lexington.

Mr. Butler (Continuing): Lexington Mill and Elevator Company at Lexington, Nebraska.

A. I should say that the Alsop Process owns the patents covering that. Of course, they bought the rights, and it now belongs to them.

Q. How many bleachers does your company own at that

mill? A. We don't own any at that mill.

Q. I misunderstood you.

A. Well, I explained, Mr. Butler, that we owned the rights under the patent, and we sold those rights to this mill that you refer to; and the machinery and the rights, so far as that particular mill was concerned, of course, now belongs to them.

Q. Does the Alsop Process Company receive a royalty upon flour bleached in that mill. A. It does not. 132

Q. By those machines? A. It does not.

Mr. Butler: That is all.

The Court: Any cross-examination?

Mr. Smith: I think not.

Mr. Elliott: I want to ask Mr. Mitchell one question. Does the Alsop Company receive a royalty from the use of any of the machines from any mill?

Mr. Butler: Objected to as irrelevant and immaterial, and not cross-examination.

The Court: He may answer.

A. It does not.

Mr. Butler: Did it ever?

A. Yes, soon after-

Q. (Interrupting) Well, I will just ask you another question? When did it cease to collect royalties?

A. I couldn't state exactly.

Q. About when?

A. It has been perhaps three years ago, and there were only three or four mills that did that, and that was done at their request, but that was discontinued when they purchased

the rights the same as the other mills.

- Q. What do you mean by "purchased the rights"? Do you mean to distinguish between the ordinary sale of an article that is protected by patent, as, for instance, the plows in farm machinery are, or used to be patented, and they were sold to the farmers, and became the property of the farmers to use. Now, do—what do you mean by selling the rights?
- A. Well, I mean this: That we had patents on a process for treating flour with electricity, and we sold rights under that process, to use it in the various mills, and the company originally sold those rights before it was in the business of manufacturing the machinery.

Q. The machinery would be manufactured by somebody

else? A. In the beginning.

Q. So that, with respect to this particular—how many bleachers are in the mill, of the Alsop Process type.

A. How many bleachers?

133 Q. Yes.

A. You mean how many machines do they have for practicing the process?

Q. Yes. Do you know?

A. I don't know. I know they must have one, and they may have two. Most mills have an extra machine—an emergency machine.

Q. I am not talking about any other mill.

A. I am speaking about that one.

Q. They have one, and maybe two.

A. Yes, a good many do.

Q. The rate of pay, the compensation, or money received by the Alsop Company from this particular claimant,—is that measured in any way by the extent of use of the process?

A. Absolutely not, now. The price in the beginning was

based on their output, of course.

Q. That is, the price of the machine is based upon their daily capacity.

A. The price of the rights to use the process is based upon

their daily capacity.

- Q. Yes, and their daily capacity in this particular case is how much?
  - A. Well, I don't remember, Mr. Butler. Q. Well, about how much, Mr. Mitchell.

A. I don't know, I do not know.

2. Yes, you done hold that in mind particularly?

- A. I can't remember no. I can't remember, no,—there are so many.
- Q. But, for example, the price of such a bleacher to a miller we will say of one hundred barrels a day output, would be less than if in a case of a mill of five hundred?

A. It would.

Q. Yes? And so on up. A. Yes, sir.

Q. So the price of the right to use the process depends upon the capacity or output of a mill? A. That's right.

Q. Now, upon which? The capacity or the output.

A. The capacity of the mill for 24 hours.

Q. Yes?

A. —is the basis on which the right to use the process is

Q. Yes? And even though the mill wasn't running to full capacity, the price would be the same as if it was.

A. Exactly.

134 Q. Yes.

Mr. Butler: That is all.

(Witness excused)

Mr. Butler: Mr. B. O. Terry.

B. O. Terry, a witness of lawful age, being produced, sworn and examined on behalf of the government, testified as follows.

### Direct Examination.

By Mr. Butler:

Q. Where do you live, Mr. Terry? A. I live at Greencastle, Missouri.

Q. What is your business?

A. I am in the general merchandise business now.

Q. That is a general store at Greencastle. A. Yes, sir.

The Court: Greencastle, Missouri?

A. Yes, sir.

Q. Are you the same B. O. Terry who is named in the papers in this suit?

A. I suppose so. I am the only B. O. Terry there.

- Q. How long have you been a storekeeper at Greencastle?
- A. Just went into business there a year ago last March.
- Q. Do you deal in flour. A. Yes, sir. Q. Sell flour at retail? A. Yes, sir.

Q. Prior to your going into this business had you ever dealt in flour? A. No. sir.

Q. Can you give us about the volume of your business in flour—about how much flour you have sold since you have been

A. Well, I think about three carloads a year.

Q. At the rate of about three corloads a year, and you have been about fifteen or sixteen months in the business?

A. 15 months.

Q. So, altogether, about four carloads?

in business there, bought and sold?

A. Yes, sir.

Q. What was your occupation before you were storekeeper?

A. I was a farmer.

Q. In that vicinity? A. Yes, sir.

135 Q. Prior to the receipt of the flour which was seized in this case had you ever procured any flour from the claimant, the Lexington Mill and Elevator Company of Lexington, Nebraska? A. No, sir.

Q. How was the order for this flour given,-to a salesman,

or otherwise. A. To a salesman.

The Court: What we call a commercial traveler called on you?

The Witness: Yes, sir.

Q. And was the order given in writing? Was there a written order? A. Well, yes. He gave me a duplicate.

Q. Yes. He wrote out an order and gave you a duplicate

of it? A. Yes, sir.

Q. Have you that writing with you? A. Yes, sir.

Q. Will you produce it please, and all the writings that this company gave you with respect to this particular transaction? A. (Producing paper) Here is the order itself.

Q. Yes. Was there any other writing?

A. Here is the guarantee, I believe. This is the guarantee. They gave me that.

(Documents referred to marked respectively 4 and 5)

Mr. Butler: (To the clerk) Have you a pin, please? Have you a pin please to fasten Exhibits 4 and 5 together?

Mr. Scarritt: Here is one.

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Mr. Butler: Thank you very much. Government Exhibits 4 and 5 are offered in evidence.

Mr. Smith: No objection.

Q. How many sacks of flour did you receive from this company? A. 625.

Q. What size sacks? A. 48 pound sacks.

The Court: Sir?
A. 48 pounds sacks.

The Court: Forty eight,

Q. When did you receive them.

36 A. It arrived the 7th day of April?

The Court: Of-

Mr. Butler: April last?

The Witness: 1910.

Q. How many sacks were seized by the marshal in this case?
A. Well, he took just what I had, the morning of the 11th.
He came in, we had sold a few out, the Friday and Saturday before, I think—

Q. (Interrupting) About how many in all.

A. I think he counted them 597.

Q. Yes? So it was about that. A. Yes, sir, about that.

The Court: You had sold twenty or thirty?

A. Yes, sir,-

The Court: Something like that?

A. Yes.

Mr. Scarritt: Twenty-eight?

Q. Was the flour seized by the marshal in the same sacks that it was shipped to you in? A. Yes, sir.

Q. Had the sacks been opened or broken at all?

A. No, sir.

Q. Did you know prior to the seizure in the case that this flour had been bleached by the Alsop Process?

A. No, sir, I knew nothing about it.

Q. What was the price paid for this flour?

A. Five dollars a barrel.

Q. That was the price agreed to be paid? A. Yes, sir.

The Court: Counting four sacks to the barrel?

A. Yes, sir.

Q. It is stated in the answer in this case, that it was not in fact paid for, but that they have since furnished you other

flour in place of this. What was the price of patent flour, by car loads, at Greencastle at the time you gave this order?

Mr. Smith: That is objected to as incompetent, irrelevant and immaterial.

The Court: He may answer it.

A. Will you please state the question again.

The Court: The gentleman will read it.

137 (Last question read)

A. To the best of my recollection other mills that I was figuring with asked me \$5.30, \$5.25,—and five dollars and thirty-five cents maybe, along there.

The Court: What was the price of this that was seized? The Witness: Five Dollars.

The Court: Delivered? The Witness: Yes, sir.

The Court: Free on Board at your station?

The Witness: Yes, sir.

Q. With respect to the flour which they allege in their answer they furnished you in place of this flour that was seized, what was the name or label upon that flour?

Mr. Smith: I object to that as not the best evidence, and incompetent,

The Court: My mind was on another matter. Will you please read this to me.

(Last question read)

Mr. Smith: I object to that as not the best evidence, and immaterial.

The Court: Sustained.

Q. Was that flour bleached or not?

Mr. Smith: I object to that.

Q. Or, did the elevator company make any representations to you upon that subject?

Mr. Smith: I object to that as immaterial, incompetent and irrelevant.

The Court: He may answer.

A. This second car that I bought was specified to be unbleached.

Q. Was it the same or different; was it labeled the same or differently from the other?

Mr. Smith: I object to that as not the best evidence, incompetent, irrelevant and immaterial.

138 Mr. Butler: What is the point? That we must go and get the bags?

The Court: That ought to be [any] plain to any "proctor".

Mr. Butler: Maybe it is, to a proctor. I am just a lawyer.

Mr. Smith: The Court said we were not.

Mr. Butler: He took it back about me.

Mr. Smith: Well, that is all right. Possibly the government is the only one that has got lawyers.

Mr. Butler: I guess so.

#### Cross-Examination

By Mr. Smith:

Q. Mr. Terry, you say in the original shipment there were 625 sacks? A. Yes, sir.

Q. They were counted as they were unloaded, were they?

A. Yes, sir, they were checked up.

Q. And prior to the time that the marshal seized them, a certain number had been sold? A. Yes, sir.

Q. And, when the marshal seized them, were they counted?

A. Well, he counted them.

Q. In your presence? A. Yes, sir.

Q. And your recollection is there were 597?

A. Yes sir.

Q. Now, had any of those which had gone out been returned by the customer who bought it? A. No, sir.

Q. Were any of them ever returned by the customers who

bought them? A. No, sir.

Q. Calling your attention to this written guarantee, government Exhibit 5, I notice it says: "We, the undersigned, do hereby guarantee cream 5-x and 4-x patent flour sold and made by us to give the purchaser, B. O. Terry, entire satisfaction as to quality, and to be within the meaning of the state and national pure food laws. We, the undersigned, do further agree if cream 5-x and 4-x patent flour do not give

satisfaction to customers of B. O. Terry, refund to purchaser the purchase price of flour, if paid for, and if unpaid for remove flour from his possession at our expense." You may state whether any of the parties to whom the flour was sold by you returned it, and made complaint of the flour, and asked reclamation. A. They did not.

Mr. Butler: I think I will object to that, if it please the Court as immaterial and irrelevant.

The Court: Objection sustained.

By Mr. Smith:

Q. You may state whether or not, Mr. Terry, so far as you know, and so far as any of your customers know, to whom the flour was sold, whether it conformed to this guarantee as to giving satisfaction?

Mr. Butler: The same objection.

The Court: Objection sustained.

Q. Prior to the purchase of this flour did you have any conversation with the representative of the mills who sold it, as to whether or not it was or was not bleached?

A. I had no conversation about that. I didn't think any-

thing about that.

Q. As a matter of fact you bought the flour on the strength of this guarantee that they gave you?

A. Yes, sir.

Q. And you sold it the same way?

Mr. Butler: Objected to as immaterial.

The Court: Oh, I think so.

Mr. Smith: Sir?

The Court: I think how he sold it is immaterial.

Mr. Butler: Is that all, gentlemen?

Mr. Smith: Yes, I guess so.

Mr. Butler: We will excuse Mr. Terry from further attendance unless you gentlemen want him. We will call him later on, but I won't ask that he remain here all this time.

Mr. Smith: You will come if requested by telegraph or otherwise, during the trial?

The Witness: From home?

Mr. Butler: Yes.

140 The Witness: Yes, I will if I have to.

The Court: They are simply allowing you to go now as an accommodation to you. How far is Greencastle from here?

The Witness: One hundred and forty-eight miles.

The Court: If Mr. Smith or any of his associates wire you you will please come. Of course, your attendance, and all that

will be arranged. Those matters can be covered by arrangement entirely satisfactory to you. If they wire you please come back, and they will make it satisfactory with you.

(Witness excused.)

James H. Shepard, called as a witness on behalf of the government, being first duly sworn, testified as follows:

# Direct Examination

By Mr. Butler:

Q. Your name is James H. Shepard? A. It is.

Q. State your age, place of residence, occupation, education, and technical or special training, if any?

A. My residence is Brookings, South Dakota.

Q. Now, this room, I find the acoustics are bad here?

The Court: Speak up please. Put a little volume in your voice.

Mr. Butler: And, if you will, speak plainly, so we all can hear.

The Court: You live somewhere in South Dakota, but I didn't catch the place.

The Witness: Brookings.

The Court: Brookings?

The Witness: Brookings, South Dakota.

The Court: Your age is what?

The Witness: My age is fifty years. I am professor of chemistry of the South Dakota State College, and the chemist of the agricultural experimet station at Brookings, S. D., and I have held these positions for the last twenty-two years.

The Court: Now, Brookings,- is that the location of your State University?

The Witness: The State Agricultural College,

The Court: State Agricultural College? 141

The Witness: Yes, sir.

The Court: The same as Columbia Misouri, and Ames Iowa, and so on?

The Wtiness: Yes, sir.

The Court: All right; excuse me-has that institution got a land right from the government, the same as the other institutional colleges?

The Witness: It is a land right college, and that experimental station which investigates all agricultural problems, is located there in connection with the college.

The Court: The same as Columbia, Missouri, and Ames, Iowa?

The Witness: Same thing, yes, sir,

The Court: All right.

Q. Now, what education and experience as a teacher have you had in the line of chemistry, and state whether or not you have written any books upon the subject, and what research and so forth? I want you to state just your professional qualifications.

The Court: Yes,-throw off all modesty and tell just what. you have done. They want to know.

For nine years I have been chemist to the South Dakota Pure Food Commission. I was educated at Michigan University. I have written several text books on chemistry. I have been engaged for the last twenty-two years in original investigation along the lines of water, and all kinds of foods, plants and grains that are produced. I have been engaged for the last five years in determining the digestive co-efficient of our grains, and grasses, to see how much will digest; and I have made many researches along the line of pure food work. I have done a considerable experimenting along the lines of making digestion experiments to test out some of these new things that are prohibited by the pure food law, and of late I have-

well, again,-I have issued a great many bulletins of 142 all these different subjects in addition to other things which I have published (Laughing) Isn't that enough?

By Mr. Butler:

Q. Now, have you made any special study of bleaching flour by means of a bleaching medium? A. I have.

Q. Composed of nitrogen peroxide gas mixed with atmospheric air, such as is referred to in the patents in evidence.

A. I have.

Q. Give the Court and the jury a general idea of the extent of your investigations. The time consumed, whether or not you have taken part in any public hearings, trials, in this country or abroad involving an examination of bleaching of flour with nitrogen peroxide gas, and air mixed together, as

a bleaching medium?

A. About two or three years ago I commenced an investigation on nitrogen peroxide, as an antiseptic reagent. Not long after that I was called to North Dakota as a witness in the behalf of the State of North Dakota in a suit to restrain the pure food commissioner from enforcing the law forbidding the sale of bleached flour. I was also called to Washington D. C., and took part in the hearing before the Secretary of Agriculture at the time the hearing was held there, when this resulted in a restraining order from shipping bleached flour in Interstate Commerce. Again I was called to London, England,—

The Court: (Interrupting) Just wait a moment. The bailiff wants to make an inquiry.

(The bailiff made the inquiry mentioned, and the witness proceeded as follows.)

(Continuing) I was called to London, England in another case involving the validity of the Andrews patent.

The Court: Now, right there. I don't want to interrupt. Now, the Andrews and Alsop is practically the same thing?

The Witness: The result of their machine is the same thing.

Mr. Scarritt: If your Honor please, we object to these conclusions. The question was what experience he had bad to show that he could act—

The Court: (Interrupting) Oh, of course, we have all read the opinion in the 167th Federal or whatever it is, and he was talking about the Alsop, and now he is talking about the Andrews, and I supposed the jury would not know what he meant by that.

Mr. Scarritt: I am not objecting to your Honor's question. It was the

The Court: As I understand it the Andrews and the Alsop for practical purposes are the same thing, but I am not seeking to dictate to this witness. The opinion so recited.

Mr. Scarritt: What I was objecting to was reciting his attendance on certain things which resulted in certain legal propositions.

Mr. Butler: Oh, no. He didn't mean that. The result of the treatment is the same.

Mr. Scarritt: Oh, I understand the judge. I simply objected to the witness stating the conclusion which were arrived at, by reason of these things.

The Court: Oh, of course. You need not state that, as yet, Mr. Witness.

Mr. Scarritt: He has stated twice, your Honor, what I objected to.

The Court: Perhaps it was subject to your criticism.

Mr. Scarritt: Mr. Butler didn't call for that in his question.

The Court: I knew what the witness meant, when he said Alsop, and when he said Andrews patent, but I assumed the jury didn't know; you can explain that in a general way.

The Witness: I shall explain that?

The Court: Yes,—in a very general way, what you mean by saying, sometimes, Alsop, and sometimes Andrews.

A. Andrews generates his peroxide gas by chemical means, by using peroxide gas with the metal. The Alsop people generate theirs by electrical means, by means of a strong current, but they both use the gas.

144 The Court: Now, the Frenchman, Frichot-

The Witness: (Interrupting) Frichot had a machine wherein he used electricity, but he was using a different product.

The Court: Yes.

The Witness: (Continuing) He used a very high tension current, and his points were a good ways apart, and, instead of making the flame discharge like the Andrews people it made just a gentle glow across the space, and the wheat went through there. That generated ozone. The Andrews process generates nitrogen peroxide.

The Court: And so does the Alsop, does it?

The Witness: And the Alsop process generates nitrogen peroxide.

The Court: All right.

The Witness: (Continuing) And that is what the claim was over there. They were trying to prove that the Frichot,—

Mr. Scarritt (Interrupting): Now, we object to that.

The Court: Never mind that. That isn't it.

Mr. Smith: Unless he permits us to show the results,-

Mr. Butler: No, we didn't call for that, nor your Honor didn't, and the witness is wholly excusable—

The Court: Yes, if there was any wrong done by me—I thought I would clear that up in a general way.

By Mr. Butler:

Q. You are familiar with the process for bleaching flour, referred to in the pleadings in this case as the Alsop process?

A. I am.

Q. I would like to have [—] explain to the court and jury the essential features of that process for bleaching flour. Make

it as plain and distinct as possible.

A. The essential apparatus in the Alsop process is a chamber—a small chamber—with two electrodes. One is made to approach the other,—one is stationary and one is raised up and down by suitable crank motion. These electrodes

are charged with a heavy current of electricity. There 145 is a considerable quantity of this current, so when these points touch the current flows just for a second, and when they are pulled apart in this way (indicating) there is a flaming discharge takes place between the two; this flaming discharge is of a very high temperature. It is of a high temperature.-so much higher than the ordinary temperature of combustion, where gold or gas or anything of that kind burns, that it causes the nitrogen that is in the air,-and you know there are two gases in the air that concern us, one is nitrogen. About three-quarters of the air is nitrogen, and about a quarter of it is oxygen. Well, this temperature is so high that this nitrogen and oxygen combines,—they actually burn, as we might say, and the result of it is a product that you will hear a great deal about, called nitrogen peroxide. That is the name of the compound. Now, this compound is generated in this small box. As soon as the electrode has been separated, a portion of this peroxide is formed. Now, while the electrode is returning a current of air sweeps out what was made in there and draws in a fresh supply of air; so that each flash has a fresh supply of air, and the peroxide that is made is swept along. That is carried by a tube to a box that is provided with rotating apparatus, and the stream of flour, -the finished flour from the mill comes into this agitator, and it is spread all out like that (Indicating) and falls down through the air, and it the air, and this nitrogen peroxide coming up through, and during this passage the bleaching is effected.

Q. I find in the specifications of the patent which is here marked Exhibit 1,—it is marked Exhibit A but I will change that to 1 under your Honor's suggestion.

The Court: Yes,-1.

Q. (Continuing) This statement: "I mean to identify accurately by chemical formula this gaseous medium. It has been determined by chemical analysis however that the air, treated in the manner hereinafter described, contains nitrogen peroxide", then in parenthesis "NO2" and "N2O4" a trace of ozone, and is in a state of ionization.

"N2O4" a trace of ozone, and is in a state of ionization, that is to say the air is separated into atoms, or compounds of atoms—

A. (Interrupting) Once more? The air is separated in-

Q. (Continuing) "Atoms, or compounds of atoms, which are electrically charged, some negatively and some positively, and are thus in a condition to enter into new compounds." Now, first, I desire to ask you whether NO2 and N2O4 are chemical formulae for nitrogen peroxide gas, referred to by you in your description of this process. A. They are.

Q. Yes? And O3? Is that the chemical formula for ozone?

A. It is.

Q. And, that the jury may see how it is written, I have written them correctly on this paper (exhibiting paper)?

A. That is correct. The NO2 is this nitrogen peroxide gas, at a rather high temperature, and N2O4, it may assume that form, at a lower temperature. The O3 is the ozone,—that is, pure oxygen. There is a deep-seated change, some way. The air molecule of oxygen, just as it occurs here in the air, is represented by O2—that is, 2 atoms are combined, here, together. There is one thing, with very few exceptions,—no atom can exist alone. That ozone—O3—exists only at a low temperature, at the ordinary temperatures of the atmosphere, and about like that. Heat, or anything, breaks it all up, and it goes into common oxygen again.

Q. Now, I want you to describe the substance known as nitrogen peroxide, as to its color, weight, and characteristics.

A. This nitrogen peroxide that is formed in the Alsop Process, when we have it pure, and not mixed with air—concentrated—just the pure gas, is a dark brownish red gas, that is heavier than air. It is powerfully corrosive. It is extremely poisonous, and, being inhaled in small quantities, produces an irritation of the lining membranes of the nose and the throat, and, if it were inhaled in sufficient quantities, it would

result in death. If this gas, however, be diluted with air, the same time that you dilute the gas with air, you

dilute the color, and it keeps growing lighter colored, and lighter colored, because you put more air with it, the air is colorless, and you can go on and dilute this peroxide to such a point that you may not be able to recognize it, really; but you can't dilute it very well beyond the point where the odor—the odor remains. The odor is there. You can detect it in the atmosphere, in very minute quantities, by the odor, on account of its great pungency.

By the Court:

Q. What do you mean by "corrosiveness"?

A. I mean that it eats-bites in.

By the Court:

Q. Iron-metals?

A. Oh, it will eat metals. Yes, it will. It will eat up most of the ordinary metals, especially in the presence of water. Gold and platinum would not be attacked.

By the Court:

Q. Would not? A. Would not be attacked.

By the Court:

Q. Gold and platinum?

A. No, they would not. But, all the common metals, such as iron, and zinc,—

By the Court:

Q. (Interrupting) Tin?

A. Well, tin more slowly. Tin isn't attacked by nitric acid very well, because it doesn't make a soluble salt. It makes an insoluble compound, tin oxide. It makes a tin oxide. It coats it over.

Q. Now, further, as respects nitrogen peroxide gas, without dilution, did I understand you to say that it was a heavy

gas? A. I did that.

Q. Yes? Now, with respect to the weight of air-heavier

or lighter than air?

A. Oh, it is heavier. It is considerably heavier. It is so heavy that one could take a cup of it, like this, and turn it into another cup—decant it, or turn it up, just as you would a liquid, that is, using the same motion—the same principles. It is heavier than air.

Q. Have you, yourself, visited mills and observed therein

the use of the Alsop process for bleaching flour?

A. I have.

Q. Many, or few?

A. Well, quite a good many.

Q. Quite a good many? And have you yourself, observed the nitrogen peroxide gas, after dilution by the atmosphere, into the condition that it was used for bleaching by the Alsop process? A. I have.

Q. With what respect to that, I would like to have your de-

scription?

A. It appears—if the generating box has glass sides, which it sometimes does, sometimes one can readily detect by the eye a slight color in there, and sometimes it is almost impossible to see the peroxide as it is formed. But there is always a little leakage around the agitator, and the odor is quite marked.

Q. The odor of it is observable?

A. Is observable, yes, sir.

Q. Now, it is not the same, then, as pure air, as was described by Mr. Smith in his opening, yesterday?

Mr. Smith: I object to this as leading and suggestive.

By Mr. Butler:

Q. Well, is it the same as the pure air described by Mr. Smith in his opening, yesterday?

Mr. Smith: I object to that as incompetent, irrelevant and immaterial, leading and suggestive.

The Court: Sustained.

By Mr. Butler:

Q. Is it pure air? A. It is not pure air.

Q. Now, have you observed the pipes employed to conduct the gaseous medium from the Alsop generator to the flour, to be bleached by it, in the agitator?

Mr. Smith: Pardon me, I want to object to this, Your Honor, as incompetent, irrelevant and immaterial, the witness 149 not having shown himself at all familiar with the mill in which this flour was bleached. Now, that simply raises the question, if the Court please, as to whether or not we are to deal specifically or generally, in this case, and, whatever the ruling of the court, why, I am willing to take our chances on that; but I want to call Your Honor's attention, now, so we may know where our bearings are to be.

The Court: Well, without committing myself for or against that proposition, I assume that these Alsop processes, made by this concern at St. Louis, are all made of one and the same patterns.

Mr. Smith: Well, I don't know on what theory Your Honor assumes that. There is no evidence of it, nothing to show how they are installed in the mill, as to how far this air is carried after the electrodes have generated this, or what would be the effect of carrying it a small distance or a long distance. I don't think we have a right to assume any of these things.

The Court: I am not, except on the basis of the evidence of this gentleman from St. Louis, who told in a general way, that pure air was brought into this cylinder, or compartment, where these electrodes are, one stationary, and the other moving vertically by crank motion, and, from there carried through a pipe to a box called an agitator. This is what the gentleman from St. Louis said, as I understand it. If I am wrong in that, —if I am confusing that with—

Mr. Butler: (Interrupting): It was this witness, who described the process, I think.

Mr. Smith: The gentleman from St. Louis didn't testify to it, at all.

The Court: Oh.

150 Mr. Butler: No, but they come in and say that this process treated this flour, and we have the right—well, Your Honor has ruled.

The Court: Of course, as I said to you gentlemen, in Davenport, I don't want to be confusing this with what— I went and saw one of these things.

Mr. Smith: Yes.

The Court: But I am not testifying. I went and saw myself, how it is done, I think I am confusing that with this.

Mr. Smith: I think you are confusing your general knowledge with what has been testified here, Your Honor.

Mr. Butler: No, the witness has said that sometimes there is a glass you can see in.

The Court: Now, I saw that. Now, the agitator, I didn't see in it, and I don't know as anybody says you can.

Mr. Smith: My objection goes to the point that this witness hasn't shown that he ever saw or knows anything, personally, about this mill from which this flour came. Now, the question presented, Your Honor, is, whether or not this witness will be permitted to testify about conclusions which he derived from the inspection of some other mill, or, is it to be limited to a knowledge derived from the inspection of this mill?

The Court: It will be limited to the Alsop process, but to that extent general. The Alsop or Andrews process. We will call it Alsop, for short.

Mr. Smith: Yes.

The Court: Go ahead.

The Witness: Judge, I believe I am confused on the question, now.

The Court: The objection is overruled, and the defendant excepts.

Mr. Helm: If Your Honor please, I notice Mr. Smith has not been saving his exceptions, at all times. May it be understood that the exceptions are saved, at all times? The Court: No, but, as a matter of courtesy to counsel, I have saved them for him.

Mr. Helm: So that, you desire to have them stated?

The Court: I want the exceptions, on the pivotal points saved, of course, but I can't give you general authority to fill in objections, in the record, without any limitation.

Mr. Smith: No. If you don't make the exception, and I want it, I will put it in the record.

The Court: Yes, because I assume they are matters of importance, and I want the exceptions saved.

Mr. Smith: Yes, and if you don't save them, and I think they ought to be saved, I will state them.

The Court: Very well.

A. (continuing) Yes, I have observed the pipes.

By Mr. Butler:

Q. And what did you observe about that?

A. Well, it depends largely on how long the pipes have been in the mill, and of the material of which they are constructed. These pipes wear out, after a time. They become rotten, so you can take them right in your fingers, and crumble them all up, and they have to be replaced by new pipes, unless they are made of some material that is not attacked by the gas. If made of the common iron, or galvanized iron, their life is not so very long.

By the Court:

Q. How long? A. Well, from a year to-

Mr. Smith: (Interrupting) What did he say?

A. (Continuing) Sometimes vary. Of course, it depends on the thickness of the iron. It is simply a quantitative question. It is eating all the time, and the bigger the iron, the longer it will last; that is all.

Q. Now, tell us how this air, modified by electricity, and containing nitrogen peroxide gas, destroys iron pipes. A. How it destroys iron pipes?

Q. Yes, just make that as plain as you can.

Mr. Helm: Does he say that it will destroy them?

Mr. Butler: Yes, sir, it does.

A. The peroxide of nitrogen, when it comes in contact with water, immediately splits up, and it forms two acids, one of them nitrous acid, and the other is nitric acid, one of the most powerful acids known to chemistry, one of the most corrosive, one of the greatest solvent reagents that we use in chemistry, is nitric acid, and of course this nitric acid will act, in time, anywhere, and every time that it has an opportunity to act. Comes in contact with these pipes, and it acts. That is all there is to it.

Q. And, in the ordinary use of the Alsop process, is it the gas passing through, or the medium—the air and the gas mixed, together, passing through the iron pipe, which goes into the agitator for the purpose of bleaching the flour? A. It is,

Q. And it is at the same degree of dilution in the pipe as

in the agitator?

A. Same degree. Well, let me see. Now, wait a minute. I want to be right about this.

Q. Or, does the opening of it into the agitator further di-

lute it? A. It further dilutes it, Mr. Butler.

Q. Further dilutes it? Now, generally speaking, about how large are these agitators, or boxes, or, do they vary? I want to know, is it as large as a barrel, or a hogshead?

A. Oh, it is larger than that. They are usually madewell, those that I have seen, for instance, take the upright

agitators, they are like this-(indicating).

#### By the Court:

Q. Well, now, say how many feet.

A. Oh, four or five feet in diameter, or four feet, we will say, in diameter, or three feet, along there. It depends altogether on the size of the mill, and bow large a stream is treated.

## 153 By the Court:

Q. Well, you have given the diameter. How long?

A. Well, they would be from six to eight feet high—as high as a man could reach.

## By Mr. Butler:

Q. Now, with respect to nitrogen peroxide gas, may it be produced other ways than by the flaming are which you have described as a part of the Alsop Process?

A. Almost innumerable other ways, yes, sir.

Q. And, for example, can you-

A. (Interrupting) For example—

Mr. Smith: (Interrupting) I object to that, Your Honor, as immaterial. It is shown how it is produced in this instance. We are not investigating methods which are not in controversy here, are we?

Mr. Butler: Well, no, that isn't the purpose, Your Honor may see. But this witness has given a good deal of time and

study and research to the effect of the application of oxygen upon flours and other things.

The Court: You may answer.

Mr. Smith: We save an exception.

The Court: Claimant excepts.

A. (Continuing) One specific instance, anyway. For instance, like this was a piece of iron, and immerse it in nitric acid, and warm it, and peroxide fumes will come off, or better, take copper, and nitric acid, just about take the common copper and nitric acid,—it is an experiment that any one can make,—and you will see the same dark, brownish red fumes, with suffocating odors, come off. They are peroxide fumes, and there are so many different ways, I don't suppose, perhaps, a jury would be interested in how we get the absolutely pure. It is complicated, and—

Q. (Interrupting) Well, what I want to call out, is this: are the characteristics of nitrogen peroxide gas exactly the same, however produced,—whether by the Alsop process, the flaming arc, or by chemical methods, or

other methods?

A. Nitrogen peroxide is always nitrogen peroxide, wherever you find it, and under whatever circumstances made or produced, the same as water is water. It is a definite chemical compound.

Q. Yes, that is what I was trying to make clear.

Q. In your work have you become familiar with the process of the manufacture of flour from wheat? A. I have.

Q. And with respect to the fitness of new wheat, as compared with old wheat, for milling purposes? A. I have.

Q. Characteristics of the flour made from both?

A. I have.

The Court: Speak up, please.

A. (Continuing) I have, yes sir.

By Mr. Butler:

Q. And the effect upon wheat flour, by the lapse of time, storage,—called aging? A. I have.

Q. I would like to have you describe to the jury the milling process, having regard to the use of wheat, new and old?

A. Any kind of wheat?

Q. Yes, both ways, so as to make comparison between the two, if that is convenient, or, just describe the process, if you like. Describe the milling process, first, and then perhaps, by more appropriate question, I can call for what I am trying to get at.

A. Well, in the milling process, the first step, of course, is to clean the wheat, and clean it very clean; and that is done, even, if necessary, with scrubbing. The next point, in the modern roller mill, is to temper the wheat. That is what the miller calls "tempering" it. He allows it to go through a suitable box, and blows in a certain quantity of steam. Now, that is a very important part in the process. The reason is that that toughens the outside. It makes it tough, so that, when

he goes to put it through his rolls, it won't break all up in fine particles, and go through his sieve with his flour.

Well, as soon as the wheat is tempered, it is run, then, into a set of rolls. The rolls may be divided, roughly, in two classes. Some of these rolls have little corrugations on them, and those rolls, one of them turns this way (indicating), and the other runs in the opposite way, so they are both going in the same direction, but one goes faster than the other; and the second class of roll is a roll that is polished perfectly smooth, and they run, by means of belts, just in the same way. Well, when the wheat is caught between them, you can see, then, that it is caught,-it is pulled,-it is Well, now, the first step, without going into all the numerous details,-there wouldn't be time, today, to tell them all,-the first step is, then, they go into these rough, corrugated rolls, and they touch very lightly, indeed. The bran is, almost all of it, loosened at this point, or a large part of it, at least, and it takes away some of the flour, and the shorts, also; and the grain, itself, is cracked into coarse kernels, like sand. You could take it in your fingers, you know, and rub it. These coarse pits, now, that are made in this first roll, are called "middlings". That is the technical term. They are known as "middlings", and it is by grinding these middlings that the best flour,-that is, the highest priced flour,-is made. It is from the grinding of those. Well, these middlings are purified. They put them through a purifier, and that cleans them all off. It takes off the bran,-blows the bran all away, and leaves them. Sometimes this is put on the market and sold, under various names, as breakfast foods-just that better part of the wheat. Well, now, at the time that these middlings are made depending on the wheat that you are grinding,-if it is a real starchy wheat, the very first time through the break-rolls, it shakes out a little white flour, that the miller calls the "break" flour. This break flour

is usually run into the patent flour, or, just as the miller may choose. Well, now, when these middlings have been cleaned all up, and made as pure as possible, it is carried on over to these smooth rolls, and these smooth rolls begin to crush them, and makes them fine; and from there the stream is put through a bolting cloth, and things

like that, and some of the branny portions, or the inside coats, are removed, and we get a stream, then, of patent flour. And that is called patent flour, made from the best, or middlings. Well, as I said, in the first break-rolls, the bran has some flour adhering. They don't throw that away, these days. The millers are grinding very close. As an illustration, I heard one man say—

Mr. Smith: (Interrupting) I object to that. I object to the witness testifying to what some one else told him. He was starting in to relate what he heard some one say. I object to that, as hearsay testimony.

The Witness: I will take it back, and say it, myself.

Mr. Smith: I didn't intend to scare the reporter, but it seems I did.

Mr. Butler: Yell before you get up.

Mr. Smith: No, I'll get up and then yell; I'll warn you.

The Witness: Well, it was immaterial, anyway.

Mr. Smith: Yes, sir,—that was just what I was going to object for.

A. (Continuing) Well, it is immaterial. That is taken again, understand. The flour is used again. You can take it from me that there is no flour left. Well, that flour is saved, and some of the latter flour, on the reduction of those middlings, is also saved, and it goes into a flour that they call "clear" flour. Now, we have got the highest—the patent flour, came from the middlings, and the remaining flour is called "clear" flour, but there's some of it almost shorts.

They are near shorts. It is almost cattle feed. There's three or four per cent of that, sometimes,—depends on the wheat, and that isn't put on the market, as a rule. It isn't sold. The miller has got a contemptible name for it, because he despises it. He calls it "red dog" flour, and that red-dog flour,—but sometimes it flours very high, and if it's very low they save up this red-dog flour until they get a very large quantity of it, and then they regrind it, and get baker's flour, or something like that. I don't know,—it depends on the miller. There isn't any uniformity.

The Court: For us lawyers to eat at hotels?

The Witness: Yes.

The Court: I see.

Mr. Smith: I don't know whether that is the case where they are in the hotel,—the jurors—but I don't think it is, at the one we are stopping, Your Honor.

The Court: I don't know. I cannot say about that.

A. (continuing) Now, those are not the only kind of flour that are known, or that the miller makes. Now, very often he begins in this way: He unites the stream—the patent flour and the clear flour; he runs the two together. That takes all the flour there is in the wheat, and he has got a good name for it. He calls it "straight" flour. It is straight flour.

The Court: We will take-

A. (Continuing) And it includes all the flour in the wheat.

The Court: I always have a mid-session recess, gentlemen, but a very short one—five minutes. Please be back in five minutes.

(Recess then taken for five minutes.)

The Court: Call the jury at the door, Mr. Bailiff.

James H. Shepard, resuming the stand, was examined further, and testified as follows:

158 By Mr. Butler:

Q. I think, at the time we paused, you had concluded, Professor, a description of the general features of the milling process. A. I had.

Q. In your laboratory work, do you mill flour?
A. Oh, yes. I have milled very many samples,

By the Court:

Q. You what?

A. I have milled very many samples. I have an experiment mill, and I carried on an investigation, on all of the new things that the government introduced to this country. I milled them out, and made flour from them. I made these middlings, and employed those for making macaroni. That is, these new Durum wheats, and in comparison with our spring wheats, and the Kansas red wheats, and work of that kind. I have done a very large amount of that kind of work.

Q. Now with respect to the conditioning of wheat for mill-

ing I would like to have you-

Mr. Butler (interrupting): Oh, I didn't observe you were absent, Judge Scarritt. We had just spoken of his experimental mill, with which you are familiar.

Q. (Continuing) With respect to the shipment of new wheat, as compared with old wheat, for milling, other things being the same? A. I would like to get your question.

Q. Well, what I am trying to get at, is this. Is new wheat, taken right from the harvest field and threshed out from the shock, as fit for milling, or as well adapted for milling, as would the same wheat become, if stacked before threshing, and if stored, after threshing, for a time?

A. No, it would not,

Q. Well, now, explain that to the jury, about the condi-

tioning—that is what I am trying to get at.

A. Well, when a wheat is first harvested, the best practice is, to cut it,—especially, that is, we cut it, as we say, a little bit on the green side. We allow it to dry in the shock.

Mr. Butler: Can you hear him, Judge Scarritt?

Mr. Scarritt: I heard him say "with us".

Mr. Lyons: That is, South Dakota.

Mr. Butler: He says he cuts it a little on the green side. Just a little before ripe, I think?

Mr. Scarritt: In South Dakota?

Mr. Butler: The best read men, I am asking about.

A. (Continuing) Then, after the wheat is dried in the shock we put it in the stacks. Well, as soon as it gets in the stacks, it begins, in a very few days, to sweat. It becomes warm. The straw is tough. You could take it, and wring it, this way, and the wheat undergoes a change while it is going through this sweat in the stack. It comes out plumper and it has a better color, and it has a better taste, and better flavor, and it is better adapted for milling purposes. Well, now then, as soon as the wheat has become dry in the stack, it is threshed and put in bins. Now, the wheat undergoes the second sweat, in the bin, and when it becomes dry, there, it is in prime condition for milling. It is in prime condition for milling. It makes a good flour, and that is what we call a properly aged and conditioned wheat. Now, as to the cause of these changes, we have been in the habit of looking at them just as-we say they sweat. That is, the physical-the external evidence that some kind of changes are going on. We now know that these changes are due to very minute quantities of bodiesThe Court (Interrupting): Professor, don't lean back. I am afraid you will fall back.

The Witness: No, I won't.

The Court: Well, you keep me nervous.

A. (continuing) Well, these bodies are called enzymes.

Called enzymes.

160 By Mr. Smith:

Q. What are they called, Doctor?

A. Enzymes.

Mr Butler: Enzymes—e-n-z-y-m-e-s—I had the same trouble learning the words.

(Continuing) Now, these are secreted from Durum grain, and these plants decrease these enzymes, and their office is a digestive one-to digest, and change over. For instance, when the wheat is planted in the ground, these enzymes begin to act on the starch that is stored up in the wheat, and they will turn it into sugar, and it becomes soluble, and the new plant that has thrown its root into the ground, and its leaf into the air, can drink up this sugar, and build it over into plant issue. There is another enzyme, in there, that attacks the protein, and makes what you call the gluten in the flour, or the protein in the wheat, and renders that more soluble. Now, whenever you change or alter the condition of a kernel of wheat, there is implanted in it an instinct, as we might say, to germinate-to reproduce itself, again. Now, you place it in the stack, and it is dark, in there, and warm. It is somewhat warm, and it immediately endeavors to germinate. There is a change going onmodification going on of the contents, but there isn't enough water, there, and sufficient to cause the wheat to germinate, and when it finds it is useless to try to grow in there, it quits. It subsides. The sweating stops. The stack dries out, and the same thing happens again when the wheat is stored in the bin. It tries once more. It has got in another place, and it wants to germinate. Once more it endeavors to do it. Now, if it is taken to the mill-the wheat, at this point, and ground into flour the general impression is that the life is all ground out of that kernel. Well there can't be a worse misconception. It is absolutely untrue. There are millions and millions of cells in the They have got the enzymes flour that are absolutely intact. there. They have got the whole machinery—the whole protoplasmic matter, and when we come to the form of flour

plasmic matter, and when we come to the form of flour 161 there is once more in these cells an endeavor to grow, if you please, and the flour undergoes another sweat. It developes agreeable odors, and so on, like that, and it improves in quality and in color, and like that; and this, we call natural aging. Now, as an illustration, just before I left home, I sent my man down to the mill, to bring up some loads of feed. He brought up some sacks, there. When we went to open the shorts it had been standing there in the sacks, until once more this sweat,-this enzymotic work had begun, and it had got so warm that when I ran my hand down there it was almost uncomfortable. Quite a large amount of heat is developed in this natural aging. Well, if you take a raw wheat, and grind it,that is one that hasn't gone through this natural aging,-you will get some flour but that flour will not be as good as the flour from the properly aged and conditioned wheat. Everybody knows that, and if you happen to bring home a sack of it, as I have done, sometimes, you will surely hear from your wife, because it won't bake right. It won't make a good loaf volume, and she will say "There is something the matter with this flour, now, and I want you to take this flour back, or have it sent back. There is something wrong with it. don't raise right. It don't work right. the bread is baked, it don't have the loaf volume, and it is altogether unsatisfactory." Now, you take that flour, and leave it a while, and it will go through this aging, or sweating process, and it will improve wonderfully, and I have known where flour like that had been sen; back, and stored in the mill for a while, and sent right back to the house, and it was perfectly satisfactory. It would not be so good, though, as flour that had been made from wheat that had been handled and treated just right. Well, now, then, even when wheat has been handled and ground into flour-I mean properly aged wheat,-when

the flour is first ground, it is not so good. It needs this other conditioning. This natural aging that it goes

through, after it has been made into flour.

Q. Do I understand the aging and conditioning of wheat for milling, by going through the sweat as you have described it, is due to the action of enzymes, as you have described?

A. Yes. Of course, there are other cell forces at work—this protoplasmic matter in the cells, and there is a balance. One tears down, and the other builds up, but there are chemic-

al changes.

Q. Now, as to the flour, or quality of flour made from new wheat—that is, wheat that has not been aged or conditioned, compared with flour made from the same wheat, other things being equal, that has been aged and conditioned, what can you say as to that—the quality or flavor of the flour?

A. We can say that the flour made from the aged and conditioned wheat is a better flour than that made from the raw

wheat, I tried to make that plain to the jury.

Q. Yes. Now, as respects the flour, or quality of flour, freshly milled, whether made from new or old wheat, as compared with the quality of the same flour, after the lapse of time and storage under normal and proper conditions?

A. The stored and properly aged flour is always the better flour than the freshly milled flour, no matter what source

it comes from.

Q. What changes take place in this natural aging of flour, as respects its appearance, and the various constituents of the

flour, if you know?

- A. In the first place, there is a change in color. The flour grows a little lighter colored. It grows to a beautiful, creamy white color. In regard to the gluten, the gluten is improved in it's toughness, in its elasticity, and it makes a better volume of bread. In regard to its flavor, by going through these sweats, or these enzymotic processes, there are agreeable flavors and odors that are developed, and these appear in the bread, when the bread is baked.
- 163 Q. Now, as respects the color and appearance of flour, made from new wheat, as compared with flour made from light wheat, which has been conditioned, I would like to get you to speak of that.

A. The color of the aged, properly conditioned wheat, is lighter, and of a more desirable shade, than that made from

the unconditioned wheat.

Q. You said the color of the wheat—you meant the—

A. (Interrupting) I mean the color of the flour.

## By Mr. Elliott:

Q. The what?

A. The color. This is what I mean to say, Mr. Elliott, that the color of the flour made from properly aged and conditioned wheat, is better than that of flour made from new wheat, right from the shock to the—

### By Mr. Butler:

Q. (Interrupting) And when you say "better"—the flour is comparatively light in color, or white. I would like to have you say in what respect the color is different, as to hue.

A. It is a difference in the shade of the color. The best patent flours have a very—that is, our best patent, from number one Durum, a number one, wheat, are of a very light, creamy tint, and that has been used as a standard, and that flour is very good flour, and consequently, anything that more nearly approaches that peculiar color, is, generally speaking, called better. Now, as far as I am concerned, myself, I like the one, or some of the Durums, better, because it is a great deal darker than all these, but it isn't my say-so. We are talking, now, about commercial processes, and the commercial

usages—what the millers understand, and what the people understand by preferable colors.

Q. What effect upon the color of flour, has the application

of the Alsop process. A. It bleaches out the color.

Q. Makes it lighter in color,—of lighter hue—of whiter hue?

A. Makes it lighter in color. Sometimes it will almost approach chalky whiteness, depending on how it has been handled.

Q. Will it have the effect you have just described upon flour made from new wheat, which has not been aged and conditioned? A. On any flour.

Q. On any flour? A. Yes, sir.

Q. And, the effect upon color of flour is the same, without regard to the grinding of the wheat?

Mr. Elliott: I object to Mr. Butler testifying.

Mr. Smith: That is leading.

Mr. Butler: Well, I think it is a proper question.

The Court: You may answer it. Go ahead Professor.

A. It tends to bleach. It tends to bleach them to a standard color, irrespective of the age of the wheat, or previous condition.

By Mr. Butler:

Q. What effect would it have upon a clear flour, as re-

spects color? A. It would make it lighter.

Q. What is the difference, in color, between a clear flour and a patent flour, when neither is bleached. Which is the lighter. A. The patent flour will be the lighter.

Q. What is the difference in color between a clear flour and

a straight flour? Which is lighter?

A. A well milled straight flour should have a somewhat lighter color than clear.

Q. What effect does the bleaching process have upon the straight flour, as respects color?

A. It will make it lighter in color.

Q. By the application of the Alsop process for bleaching flour, have you ascertained whether or not any substances are added to the flour, or imparted to it? A. I have.

Q. What is the truth in that regard?

A. The truth of the matter is, in regard to that, that the nitrogen peroxide, of course, is added to the flour. Certain chemical changes, as it unites with the water, makes

tain chemical changes, as it unites with the water, makes the two acids, and, therefore, we have nitrates from the nitric acid that has been added, and we also have nitrites, or nitrous acid, itself, which has been added.

Q. Is there water in flour? A. There is.

Q. How much, ordinarily?

A. Well, with us, it runs from ten per cent to twelve per cent, depending on how the flour has—

Q. (Interrupting) In bulk, or weight? A. By weight.

Q. By weight? That is, one hundred pounds of flour, or, we will say a barrel,—call it two hundred pounds,—would have twenty pounds of water—twenty to twenty-four pounds of water? A. Yes, sir.

Q. And is capable of being extracted directly from the flour? A. It can be extracted directly from the flour.

Q. And, when this gaseous medium—atmosphere and nitrogen peroxide mixed,—is introduced into the agitator, where the flour is in a state of agitation, what chemical changes take place then, by reason of the presence of the nitrogen peroxide gas?

A. It immediately united with the water, and changes into two acids, one nitrous acid, and the other nitric acid. That

is the first step.

Q. Describe nitrous acid.

A. Nitrous acid is a rather weak acid, as we describe it. It has never been prepared, pure, only in water solution. If placed in an open dish, or in an open bottle, it is constantly giving off peroxide of nitrogen fumes, reddish fumes, arising in the air. If it is exposed to the air, it will take up oxygen, and go into the next, the higher acid,—go to nitric acid,—to the stronger acid. It will unite with the alkalies, too, from salts, called the nitrites, and with the metals, to form salts, called the nitrites.

Q. Now, that is nitrous acid? A. That is nitrous acid.

Q. Now, as to its character—whether poisonous, or not?

A. It is a poisonous substance.

Q. As to the character of the nitrites, which are formed by a combination of nitrous acid with the bases to which you have referred?

A. They are poisonous, also.

Q. Are such nitrites formed in flour, by the application of the bleaching process—the Alsop process, referred to in

these pleadings?

A. There has been some controversy as to whether nitrites have been formed or whether it is the nitrous acid. It is salts that is there, and we have been in the habit of speaking of the two as nitrite reacting material.

Mr. Elliott: Now, who does the witness mean by "we"?

The Witness: I mean, by "we", the chemists of the United States, and the honorable attorneys who are engaged in this flour-in prosecutions and in their investigations. We have always referred to it as nitrite reacting material. There is some evidence, I think, that will be brought before this jury, to show that this is principally nitrous acid that is in the flour.

By Mr. Butler:

Q. Now, do I understand this interchange between you and Brother Elliott, on his interruption, that nitrite reacting material is the broader term, and includes a nitrite-that is the combination of nitrous acid with the bases, and would also include the nitrous acid, itself? A. It would,

O. Yes?

A. Anything that will give the reaction for nitrous acid, whether it is a pure acid, or whether it is a salt of that acid.

Q. And, by "we", you referred to yourself, and Mr. Elliott, among others, as referring to that condition of affairs as nitrites?

A. Well, that was what was uppermost in my mind. I was thinking of Mr. Elliott. I must confess we have talked about it that way.

Q. You mean, in the suit of the Russel Milling Company, against the Pure Food Commissioner of North Dakota?

Mr. Smith: I object to that as incompetent and irrelevant.

The Court: I can't see the materiality of that. 167

Mr. Smith: You can't go into the question of where these gentlemen have met together.

The Court: No, that might be unsafe.

Mr. Smith: Your Honor, I don't think we had better go into that.

The Witness: That lets us out, Mr. Elliott,

Mr. Butler: Your Honor will observe that it isn't our side that is afraid.

Mr. Smith: Well, I don't care about embarrassing the Doctor, too much.

The Court: Well, this is only thrown in as a little bit of witticism. Perhaps it is just as well left out. Of course, I mean nothing objectionable to either side, here. Mr. Elliott, I guess, understands that.

By Mr. Butler:

Q. Now, as to the nitric acid. Now about that? Is that capable of isolation? Is it [staple], or weak, or strong, or what does that do, in flour, when introduced by the Alsop process.

A. Nitric acid is one of the three most important acids

known to chemistry.

Q. By the way, is that sometimes called aqua fortis?

A. Aqua fortis, or strong water. That is the name for it. It is a very corrosive acid, and you can buy it at any drug store, anywhere in the United States, probably, and it is a very corrosive acid, a great solvent, and it unites with metals to form salts, that we call nitrates—a common one that everybody knows is silver nitrate, or lunar caustic, and potassium nitrate, or saltpeter is well known to everybody, and sodium nitrate is known to every farmer in the country that uses fertilizer—Chili saltpeter. These are very common compounds, that are formed from nitric acid. Now, this acid is one of the most corrosive acids known. If you get the least mite of it on your fingers, it will turn them to a yellow color, and if it is dropped on clothes, it will burn holes through the clothes. It

will disolve all the metals, excepting gold and platinum, and some of the rarer ones, that is to say tin; it doesn't work very well on tin, but all the common metals, it will eat them up, as we say. It will dissolve them, and make them into

salts.

Q. Now, is there any difference in the changes made in wheat flour by bleaching by the Alsop process, and the changes which take place in natural aging?

A. They are not at all comparable.

Q. Will you compare them, to the jury, for the purpose of

contrasting them?

In the first place, they are both—both the natural aging and the bleaching by the Alsop process, causes the color to become lighter, and, in so far, they are comparable. When we have gone that far, that is as far as we can go. If that is pushed to its ultimate analysis, the color that is made—the color that is made is always uniform, on the natural bleaching. doesn't assume the chalky whiteness that the bleached flour does, when it is bleached, very frequently, at least. again, as I have already explained. This enzymic action that goes on while the flour is naturally aging, produces agreeable flavors and odors, while on the other hand, the Alsop process introduces disagreeable odors and flavors. By natural bleaching, the flour begins to improve, and goes on and improves, and improves, and improves until it gets better—until it reaches, its highest point, we will say. This will last over a period, sometimes, of two or three months or even longer, if it is properly handled. The flour that has been bleached by the Alsop process is just as good, the minute it comes out of the bleacher, as it ever will be. There can be no change in that flour, that has been bleached. There will be no enzymotic changes. The introduction of these strong acids has caused the enzymes to quit work. They don't go on. They can't do any more work, and the result is, that the only change that can come to the

flour, bleached by the Alsop processes, will be, away along at some time when it is said bacterial action sets in, and the flour begins to go back and decay. The same thing will happen to flour that is naturally aged. All flour has its life. It doesn't live forever. It can't live forever. And the time will come when both of them are attacked by molds and fungae, and various things of that kind, and will begin to

decay and deteriorate.

Q. Is the digestibility of flour affected favorably or injuriously, or at all, by bleaching it by the Alsop process, at the

time it is milled?

A. I have made a great many experiments along that line, and I have learned that the digestibility of the bread, made from flour bleached by the Alsop process, is damaged—is injured.

Q. As to digestibility?

A. Its digestibilty is injured.

Q. Can you give us an idea of the quantities of these nitrites or nitrite reacting material, that is added by the bleaching by the Alsop process, or that is required to effect substantial

bleaching?

A. That will depend on a number of factors. Some grades of wheat that are very good grades of wheat, and naturally produce a rather light colored flour, only need small quantities. Other wheats, that produce dark colored flour—yellow flour—requires larger quantities, and the truth of the matter is that nobody knows—the miller, himself, doesn't know how much peroxide he adds. He simply adds enough to reach a certain color, be it little or be it great. In my own experiments, I used from two and a half parts per million, along down the scale—or up the scale, to one hundred eighty parts of nitrogen peroxide.

By The Court:

Q. One hundred eighty out of a million?

A. Yes, that is, in a million anything,—a million pounds would be a hundred and eighty pounds of the peroxide.

O. Yes, I understand.

A. (Continuing) Or, in a million grains or a million anything, by weight. And we went all the way from two and a

half parts per million up to one hundred eighty parts
per million. In the flours with which I was working,
I reached the points where the flour began to become
very white, when I was using from—well, from twenty to forty
or sixty parts per million.

And did you observe the effect upon the color?

A. I did.

Q. Of the application of various quantities? A. I did.

Q. From this two and a half parts per million, up to one

hundred eighty parts per million? A. I did.

Q. Now, will you explain to the jury what the color is,—that is, what are the primary colors, alone or in combination, in the wheat flour?

A. The coloring matter of wheat flour, or the color of wheat flour, as we see it, is not a simple color. It is owing to a mixture of two colors. We all know how different colors can be mixed, and they will produce another color. Take two colors, mix them together, and you will have something of a different color. Now, the color of the wheat flour consists of two of the primary colors. One is yellow, and the other is orange. Now,—

Q. (Interrupting) In what relation? Well, go ahead.

A. (Continuing) Now, the darker colored wheats have more of the orange. The darker colored flours have more of the orange and the lighter colored have more of the yellow. The yellow isn't so pronounced, you know, just a light yellow—a very light yellow, and the orange, of course, has quite a deeper shade, as you all know.

Q. Well, now, is the effect upon both primary colors, the same, upon the application of this bleaching medium used in the Alsop process—that is, does the orange and yellow reduce

equally, as the process goes on? A. No, they do not.

Q. Can you give the-

A. (Interrupting) They both begin to fade. Would you like the exact figures.

Q. Well, generally, the substance of them, and later I will.

A. Yes. The orange begins to fade away. It fades away, first. The yellow also fades away, but you will soon reach a point, if you keep on adding more peroxide, where the orange

disappears entirely, and, no matter how much you add 171 after that, that orange color never will come back

again; but, when you get down very near to the zero point on your yellow, when your flour is almost chalky white, you put in some more peroxide, and the yellow will begin to come back again, and, as you add more, you will notice an increase of the yellow color. There is a point, but it is not of practical importance, I am sure, in this case, because the millers don't go to that point, because they couldn't sell their

If it were overbleached, you would find you very much more yellow, in overbleached flour. That is, where it was away over-treated. You would have very much more yellow, than the flour when you first started.

Q. That is, by keeping the flour exposed long enough, in

one of these agitators, it will turn yellow?

A. Yes, and by adding more gas to it.

Yes, or by more gas, owing to either the increase of the strength of the medium, or the increase of the time of

the exposure, I suppose?

A. That would be immaterial. It would be immaterial as to that. Either one would affect it, provided you maintained a constant supply of your gas, at the one common dilution.

Now, I want to get the effect upon the quality-the Q. odor-the color of the flour, the odor, and the taste, and the smell and so forth, after this bleaching has eliminated all of the orange, and has reached such a stage that the yellow begins

to increase.

A. Well, the odor of flour is destroyed when it is bleached, ne matter how much you put in. Just two and a half parts per million, will give to that flour an odor that is very disagreeable, to me, and at the point you have mentioned, it is simply a question of intensity, and not a question of kind. It keeps smelling a little worse and worse, because a little stronger and a little stronger, that is all.

Now, have you prepared figures, showing the result of your color measurements, as against applications of different amounts of bleaching, by this process? A. I have.

Q. You may refer to them.

172 (Producing paper) I use two kinds of flour. First, patent flour. That is, a genuine patent flour, and also straight flour. My criginal patent flour, unbleached, had twelve points in the orange, and thirteen in the yellow.

That is, the amount of primary color? Q.

Of the primary color. A.

As of twelve to thirteen? 0.

Yes, when I added two and a half.

By Mr. Scarritt:

How was that? A. Twelve. It is a decimal.

By Mr. Butler:

It has a point before it?

Twelve hundredths, and thirteen hundredths, on the Lovebond scale, but we can speak of these as points, and that will make it plain to everybody.

By Mr. Helm:

Twelve of orange, and thirteen of yellow? A. Yes.

By Mr. Helm:

Q. That is, twelve and thirteen, before any of the flour was treated?

A. That is the natural color of the flour.

By Mr. Butler:

Q. Which flour was that—the straight or the patent?

A. That was a patent flour, made from Dakota number one winter wheat.

Q. Go on.

A. I added four and a half—four and five tenths parts per million of peroxide. My orange sank to two. That is, .02—two points, in the orange, and my yellow, which was thirteen, sank to eleven. You see, there is a great difference. The orange goes faster. When I use—I won't name all of them. It will illustrate it, when I used as high as eighteen

parts peroxide, per million my orange didn't seem to be affected, there. It may have been .02 and my yellow fell to .06. That would have been probably the optimum point for bleaching that flour. Eighteen parts per million would have brought that flour down to about what I understand the standard color is, that they are working to. Now, when I used seventy-two parts per million of peroxide, my orange fell to zero, and my yellow rose to eleven. I will give one other figure. When I used one hundred eighty parts of peroxide per million, the orange still remained zero, and the yellow had risen to thirteen—, just the point where I started from, on the yellow.

Q. You started at thirteen?

A. I started at the point, thirteen, and it came back to thirteen when I had used one hundred eighty. On the straight flour, the natural color of the straight flour is fifteen points in the orange, and twenty in the yellow.

The Court: Twenty?

A. Twenty, yes, sir. It is darker, you see. As compared—it is made from the same wheat.

The Court: I understand.

By Mr. Butler:

Q. That is, straight?

A. Straight flour.

Q. Yes?

A. I will only give two more. When I used forty parts—when I used [seven-two] parts per million on the straight flour, my orange sank to .04, and my yellow came down from twenty to fourteen, with one hundred eighty parts. Once more, my orange became zero, but my yellow had risen to nineteen. I started with twenty, and I got it back again.

Mr. Helm: How many parts did you use, there?

Mr. Butler: One hundred eighty.

The Court: One hundred eighty per million?

A. Yes sir.

By Mr. Butler:

Q. Now, suppose that flour subjected to this process had eighteen parts applied—eighteen parts per million,—what amount of nitrite reacting material would be recoverable by

treating the flour by water, if the analysis was made immediately afterwards? Have you studied that so as 174 to be able to transpose that into other terms? For example, take eighteen parts per million of nitrogen-peroxide. You have told us that that produces nitrite reacting material, in the flour. Now, suppose you analyze the flour immediately,

or soon?

Within a day or two? A.

Yes. How much of these eighteen parts of nitrogen peroxide would be accounted for?

A. In my analysis?

In your nitrite reacting material, so recovered, is what Q.

I am trying to get at.

A. Yes, Well, I made a great many experiments along that line, and, under no circumstances can I recover it all—that is, the theoretical amount. But I have been able to recover, as nitrites, from ten to fourteen per cent. From ten to fourteen per cent as nitrites, of all the peroxide used. That is, if I use eighteen parts peroxide, I could get back ten parts of it as nitrites reacting material-ten per cent of it, I would say.

Q. Ten per cent of it?

That would give me 1.8 as nitrite reacting A. Yes. material.

For example, then, if by testing for nitrite reacting material, the flour, a day or two after it had been bleached, you would find two parts per million of the nitrite reacting material, that would indicate how many parts of nitrogen

peroxide added?

A. Well, in a general way, but not absolutely and scientifically, because there are changes going on all the time and these changes depend on two things: First, how strong is your acid. How strong is your peroxide. The second, what is the temperature and, third, under what condition has it been stored? But there is a constant loss of this nitrite reacting material, all the while. That is, it disappears as nitrite reacting material, only to bob up as something else, a little farther on, as we will see. So if we should find, say two parts of nitrite reacting material, and we know that the flour was freshly bleached, we would be pretty safe in saying that at least twenty parts of peroxide had been used in bleaching the flour, and, if the flour had been stored for a longer time, and the conditions were unknown, it might be not only twenty times that, but it might be five times twenty times, of it might mean anything on earth. We couldn't tell anything much about it.

Q. And what is the effect of lapse of time, upon the amount of nitrite reacting material recoverable by this test?

A. It is constantly reduced.

Q. That is, under any ordinary conditions?

A. Under any conditions.

Q. Under any conditions? A. Under any conditions.

Q. And what becomes of it. Can that be told?

A. I believe we know what becomes of it.

Q. Well, tell us what becomes of it.

Mr. Smith: I didn't catch the answer.

Mr. Butler: He said, "I believe we know", as I understand it.

The Witness: Yes, sir.

The Court: Repeat your answer; the gentleman didn't hear it.

The Witness: I was just thinking about how I wanted to state it.

Mr. Butler: But, your answer was,—I asked you if it was known what became of it, and you said that it was.

The Witness: Yes, I did. Well, I think—well, I went to say, I think—I know—"know it", that the nitrous acid and the nitrite reacting material is being constantly changed into nitric acid and that will account for the disappearance of our nitrite material. But there are other ways by which it disappears. Some of it will evaporate. That you can't help. Some of it will be lost by evaporation.

176 Q. Some of it will?

A. Yes, but not a very large quantity, that way. This gas seems to be held by the water that is in the flour, and also by coming in physical contact with the flour, itself. And, so far as I know, we haven't any evidence now, that this nitrite reacting material, as we call it, is much of anything else, except free nitrous acid.

Mr. Helm: Did you say nitrous acid?

A. Nitrous acid, yes sir.

The Court: I guess, Mr. Butler, we will stop at this point, 'til two o'clock, to which time Court is in recess.

(Recess taken accordingly)

Two o'clock P. M. Thursday, June 2, 1910.

The Court: That gentleman may assume the witness chair.

James H. Shepard, resuming the stand, was examined further, and testified as follows:

The Court: Read the last question and answer, please.

(Question and answer read as requested)

The Witness: I didn't quite finish.

Mr. Butler: You may go on, and finish.

- A. It may be that some of the nitrous acid could be combined with metallic bases, but the probabilities are somewhat against it.
- Q. (Handing the witness a bottle) I will call your attention to a bottle, which may be marked, "Government's Exhibit 6", and ask you if you know what it contains?

A. I do.

Q. What does it contain?

Mr. Scarritt: I can't quite hear your questions.

The Court: He asks what this bottle contains. The witness says he knows.

By Mr. Butler:

Q. What does it contain?

A. It contains a mixture of nitrogen-peroxide, and air, about one part—approximately one part of nitrogen-peroxide, to four of air.

The Court: One to four?

A. One to four.

By Mr. Butler:

- Q. About one to four?
- A. It is dilute.
- Q. And that is the same substance that is generated by the flaming arc in the Alsop process?

A. It is the same substance.

Q. And the same substance which you described this morning, as a heavy poisonous gas? A. Yes, it is.

The Court: Is it offensive, Doctor?

A. It is offensive.

By Mr. Butler:

Q. Gas, like all gases, it can be poured from that bottle into a cup or beaker, like that? A. It will.

By Mr. Butler:

Q. Perhaps there ought to be a tag or something, put on that bottle, if it is desired it be retained. What is your wish about that, gentlemen?

Mr. Smith: I don't know as I have any.

Mr. Butler: Well, then, I will ask that you open the bottle and show the substance to the Court, as it will pour from that bottle into the other vessel. Maybe the Court or Jury would like to—

The Court: (interrupting) You say that is one part peroxide and four of air?

The Witness: Of air, yes, sir. It isn't pure peroxide. That is, what I mean by that, it isn't concentrated peroxide.

The Court: Doctor, would you please stand around here, so both the jury and counsel can see you.

178 The Witness: Now, the light, of course, is not very favorable. If the gentlemen of the jury will notice, I think you can see the color begin to show in the bottle.

Mr. Butler: If you would put a white sheet of paper back of it, perhaps it would show up better.

The Witness: I would suggest it would be a good plan to raise that shade, there, so we can get a white effect on it.

By Mr. Butler:

Q. (Handing witness a white sheet of paper) If this is any use to you, you may use it.

The Witness: Thank you. Of course, if this were pure peroxide, it would pour much more readily, and I will have to pour somewhat carefully, and you are to look down in this jar, and see the color appear down there. Now, if this were lighter than air, when I go to pour it out, it would go up, and go away.

The Court: Well, now go ahead and make the demonstration.

A. (Continuing with demonstration) I don't know if you can see, as the air comes up in the jar, the air goes in on the upper part, just as if it were a liquid and, I think you can already see it, can you not?

A Juror: Yes, sir.

A. (continuing)—that I am getting color here, in the jar? (exhibiting the cork taken from the bottle marked as Government Exhibit 6) You can see the corrosive action of it, too, if you want to. You can see it has been eating the cork. It has only been in there about fifteen minutes. You see, the cork is all turned yellow. If I put my hand on it, just as it stands, it will turn it yellow. Now, it isn't a very pleasant thing to smell of, but a body can do it, with a sweep this way (indicating). If you want to get a little bit of the odor—if you want to get what the peroxide smells like, you can do it by sweeping your hand over it, that way. You can get some of it, mixed with the air. Shall I offer it to the jury.

Mr. Butler: I will leave that to the Court and Jury.

The Court: Yes.

The Witness: (to the jury) So you can see for yourselves. Of course this is diluted, now. The color is almost all gone.

A Juror: I can smell it.

The Witness: You see, it diffuses quite rapidly from the bottle. You can also, see, now, some whitish fumes, forming there, can you not? You see kind of a smoke?

A Juror: Yes.

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The Witness: That is when it is uniting with the air, to form the two acids I told you about. Won't you just take it in your hands and get a little odor, and then pass it on? (handing bottle to the jury) No, not too much (to a juror).

Mr. Lyons: Give that to the stenographer, to be marked, please.

(Exhibit marked, "Government's Exhibit 6")

Q. Do the nitrites which are added, or nitrite reacting material, which is added to the flour, remain in bread made from the flour? A. It does, to a certain extent.

Q. And some recoverable from the bread?

A. Some of it is, yes, sir.

Q. And you made some experiments—tests, to find out the relation between the nitrogen-peroxide, after bleaching flour—the amount that can be recovered from the flour, in a day or two after the bleaching, and the amount that can be recovered from bread made from the flour? A. I have.

Q. You may give the jury the result of your experiments

in that regard.

A. I made totals of the same flour, using different samples and employing different quantities of peroxide to each sample. Then we baked this into bread, also baked some unbleached flour into bread as a comparison. I found that I could recover—well, I will give two or three figures which will indicate—where I had used four and five-tenths

180 parts of peroxide per million on the flour, that I could recover .56.

By the Court:

Q. From what, flour or bread?

A. On the flour, after two days.

Q. After two days?

A. Yes sir; then I baked it into bread, and found out that the bread had of these fifty-six parts, it had forty-four of them. That is, in this particular experiment I recovered 78.6 per cent in the bread, of what I could recover from the flour before I baked it. I followed this along down through, using constantly increasing quantities of peroxide, respectively 9, 18, 36, and so on up to 180, as before, and I find that where I had used very large quantities, strange to relate, of the peroxide I recovered smaller percentages in the bread; so that in the higher quantities, where I used 180, I recovered only and I found 22 in my flour—no, I found 26 in my flour, excuse me, I got baked .22 in my bread, or only about .3 per cent.

By Mr. Smith:

Q. Is that 26.?

A. The exact figure is 26.4, whole number—26.4, and I recovered .3 per cent of that, or 22 parts, .22.

By Judge Scarritt:

Q. .3 of 1 per cent? A. .3 of 1 per cent, yes, sir.

Q. Now, that was on patent flour.

By Mr. Butler:

Q. Now, before you go on, let me see if I understand the things you are talking about. Take the first set of figures you gave us. A. Yes, sir.

Q. The four and one-half parts per million of nitrogen

peroxide. A. Yes.

Q. That was the amount of this gas which is contained in the bottle Exhibit 6, only very diluted, being four and onehalf parts to the million? A. Of flour.

Q. Of flour, was used to bleach the flour. Then you recovered .56, a little more than a half of one part, per

181 million, of flour, from the flour?

A. From the flour itself.
Q. Now, what was it you recovered, is that the gas—N O 2 or nitrogen?

A. This is all computed to N O 2 of peroxide.

Q. So that these figures are all expressive of the same thing?

A. Expressive of the same thing and the bread is reduced to the same water contents as the flour.

Q. Go on.

- Now, in the straight flour I used eighteen parts of peroxide per million, and I could find in the flour 1.98 part. I recovered in the bread .33 parts or 16.7 per cent. Now again I will give two more. Where I found 7.92 parts in my flour, I only got back .33 parts in my bread, or I recovered 4.2. Now, in the next case where I could find 9.90 parts in my flour I did not recover any in my bread at all. So that I have reached this conclusion, that the amount recoverable in the bread is going to depend on several factors. Bread can be so made by using large quantities of yeast and other expansion and allowing the yeast germs, and so forth, an opportunity to consume this material that we put into the flour, that very little of it might be recovered; but I want to say this, that that is not the way that bread is made in our ordinary households at all, the way the ordinary housewife bakes it, if there is any appreciable amount of peroxide to be recovered in the flour, a goodly percentage of it will be recovered in the bread.
- Q. What is the reason for a decreasing percentage, as you increase the amount of gas used, in large amounts like 180 parts per million, of gas, to the flour, in the patent flour, you only get three-tenths of one per cent of that added?

A. Yes, sir.

Q. Whereas, when you use four and a half parts only per

million, you get 76 per cent of that added?

A. Yes, the explanation of that, according to my understanding, is as follows: Where I have used such large quantities I have overtaxed the absorbtive power of the flour, and it is not able to hold it so well as I did where

I put in smaller quantities. Now, then, when I come to reduce it to percentages, while the amount that I actually found in the bread was about as much as it was where I used the smaller quantities of peroxide, when I came to reduce it to percentages, why, I have got such a tremendously high divisor that the percentage sinks very small.

Q. Well, the precise figures that you give us at four and a half you found forty-four parts being nitrates? A. Yes.

Q. At 180 you found twenty-two parts? A. Yes, sir.
Q. In the first instance 76 per cent of all that could be found in the flour, in the second instance only .3 of 1 per cent

of all you found?

A. So it is not so much the absolute amount that I found in the bread, you see there was not such a tremendous decrease, the amount of decrease ran from—well, I got 88 parts down to 22 parts,—that is rather the extreme decrease, but

when I come to reduce it to percentages, well, I divide 44 in one case, .44 or .56 to get my 78.6; here I am dividing my 22 by the whole number 26.4, a high figure, you see, and it makes the percentage low.

Q. Did you use yeast in making this bread? A. I did.

Q. Now, you testified this forenoon that nitrogen peroxide employed by the Alsop process for the bleaching of flour damaged the gluten of the flour, as I understood it, or injured it?

A. Yes, sir: I believe it does.

Q. Now, the gluten of the flour is usually about what pro-

portion of the flour, what per cent?

A. That depends, of course, on the variety of wheat, but I would give as the average figure 11 or 12 per cent; I have known it to run as high as 14 or 15, but I should judge around 11 or 12 per cent of the flour is gluten.

Q. And is the gluten a portion that is valuable as food?

A. Oh, that is the most valuable part of the flour.

Q. It has the greatest nutritive value; it has the greatest nutritive value, I understand?

A. I would not hardly like to express it that way, Mr.

183 Butler. The gluten or the protein foods are the scarcest

and the highest priced articles of food which we buy, as exhibited in the lean meat and eggs and so on; it is more expensive than potatoes, which are all starch, that we want to understand; and the reason for that is because it takes gluten to build up the muscle tissues and bones, and repair that waste, and so as a tissue builder it is the most—it is the most valuable, but still those other things have value also; so we must have our heat and energy. If we didn't have enough to keep up our heat and energy, why—

Q. I intended to make my comparison between the gluten

in the flour and the other ingredients of the flour?

A. Yes, sir, the gluten is more valuable than any other ingredient of the flour. We can replace the starch of the flour by using a potato if we want to, but we cannot—

Q. Will you give us the result of your study with respect to the amount of damage to the gluten of the flour resulting from the use of various amounts of this nitrogen peroxide gas

employed by the Alsop process?

A. Yes sir. I took the same flours and some unbleached and some bleached. I determined the total nitrogen, as we put it, which is an index, amounts practically to the same thing as the gluten or albumin, only we multiply the nitrogen by 6.25, to reduce it to albumin, so I have given the nitrogen only, and I will speak of this as total nitrogen and albumin nitrogen and amido nitrogen. Now, I think I ought to make a little explanation to the court and jury as to what I mean by these different expressions. I presume they would not be quite familiar with

them. This protein that we have been talking about, or gluten, now, there are three or four names that apply to it, depending on how you are thinking of it. Sometimes we call it albumin, sometimes call it gluten, sometimes call it protein. The words mean about the same thing for practical purposes, in this trial they will mean the same thing. Well, now, then, this gluten or albumin or protein, distinguished all other food from because it has nitrogen in it: the others do not have 184 nitrogen; that is, the starch has no nitrogen,-so I have got the expression total nitrogen, that means all the nitrogen I could get out of the flour. Then I have got the albuminoid nitrogen, that means a good, digestible gluten,-that is the part which is digestible, so the albumin is part again, I have got the term amid-nitrogen; now, that is something that we use continually in agricultural chemistry and feeders of stock the world over, and it is generally accepted that this amid-nitrogen is not digestible; it is no good; it goes through and is voided in the manure, and so when we are valuing a stock fool or a food for a human being we depend on our albuminoid nitrogen. Now, then with that explanation I will try and tell you in my unbleached flour,-but first of all I will say that by treatment I did not change my total nitrogen as determined by many careful duplicate determinations; and I would call your attention to the fact also that we are making thousands and thousands of these determinations every year. I have been to work at it now for five years making these, and they have been made with all the care and skill that modera apparatus and human ingenuity could devise, because I wanted results, and I wanted them just right. Now, the total nitrogen was 2.16 all the way through. Our albuminoid nitrogen in the unbleached flour was 2.06. Where I used nine parts per

Q. The albumin fell to two?

million, it fell to two.

A. The albuminoid nitrogen fell to two; and where I used 180 parts it fell to 1.97.

Mr. Elliott: Your, Honor, for the purpose of an objection I would like to ask this witness how was this flour bleached that you are talking about?

A. I bleached it myself.

Q. With what? A. With nitrogen peroxide,

Q. Did you bleach it with the Alsop machine?

A. Not with the Alsop machine.

Q. I will ask you if you have analyzed the gas of the Alsop machine, and if you know the proportion of peroxide in it to add? A. No. I have not.

Mr. Elliott: Then I object, Your Honor, to this testimony because it is not the process that was used by the claimant in bleaching his flour, and it is not germane to any—I mean any effects that Professor Shepherd got bleaching in his laboratory with pure gas, is not germane to what the Lexington Mill did, using the Alsop process.

Witness: Mr. Elliott, just one word of explanation.

The Court: Just wait a minute. Objection is overruled and the claimant excepts.

Witness: I would like to state to the gentlemen of the jury that I of course used a mixture of air in nitrogen peroxide.

Judge Scarritt: Let him state the fact.

The Court: Yes, state the fact, Doctor.

By Mr. Butler:

- Q. Let me ask you a question, in view of the assertion made by Mr. Elliott, which I have no doubt is all true, but I did not understand in that way. You stated that you employed pure nitrogen peroxide to bleach the flour; I understood you to say that there was only nine parts of that per million?
  - A. Of flour.
  - Q. And was all diluted with the atmosphere?
- A. Oh, many, many times; I only used four or five cubic centimeters of the pure nitrogen; I had four liters of air.
  - Q. That would be in percentages what?
- A. Was very much—was very, very much diluted; it would compare well with the Alsop. I want to be fair about it; I made it to compare as near as I could with what takes place in the Alsop machine.

Now, if you will allow me to return once more, I will say, now, that in the unbleached flour I found 2.06 of albuminoid nitrogen, and that fell to 1.97 where I used 180 parts.

By the Court:

Q. Per million?

A. Parts per million—no, this is percentage, excuse me, percentages. Then what happened, we see there is a constant diminution then of the albuminoid nitrogen.

186 Now then, in the amid-nitrogen, the amid-nitrogenous compound of the flour, I found in the unbleached flour .10 of 1 per cent, .10; and then in the next one where I used nine parts per million it rose to 16; where I used 36, it rose to 19; where I used 180, it rose no higher; so I had an increase of from 10 parts to 19—understand that this is dealing in one hundredths of per cent, but it is a remarkable thing, that with

these minute quantities that my experiments all went the same way; they all went the same way, and it shows what is going on.

Judge Scarritt: We object to this argument, if Your Honor please. Let the gentleman confine himself to the facts and we'll get along faster.

By Mr. Butler:

- Q. Let me ask you a question, Now, you have given us three instances, bleached flour, nine parts nitrogen peroxide per million of flour, A. Yes,
  - Q. And 180 parts uitrogen peroxide per million of flour?

A. Yes, sir.

Q. And in each instance of the bleached flour the albuminoid nitrogen decreases and the amid-nitrogen increases?

A. Yes, sir.

Q. I want to ask you whether you used any other instances with different amounts of nitrogen?

A. Oh, yes.

- Q. Now, suppose in this matter that you give each step, the whole series of experiments, to see whether or not the albuminoid—digestible nitrogen, decreases, and whether the amido, undigestible nitrogen, increases as bleaching is intensified?
- A. With no peroxide the albuminoid nitrogen was 2.60. With nine parts per million it was 2.00. With 36 parts per million it was 1.97. With 180 parts per million it was 1.97, just the same.

Q. And now the amido.

A. With the unbleached flour the amido nitrogen was .10 of 1 per cent. With nine parts flour .16 of 1 per cent. With 26 parts it was .19 of 1 per cent. With 180 it was .19 of 1 per cent. This was on the patent flour. I have figured also on the straight flour.

Q. I would like to have those ?

A. On the straight flour, unbleached, the aluminoid nitrogen is 2.13. With 36 parts per million peroxide it is 2.12. With 72 parts per million it is 2.12, and with the 180 parts per

million it is 2.10.

- Q. The amido-nitrogen? A. Now, the amido-nitrogen is unbleached .07. 36 parts .08. With 72 parts it is .08, and with 180 parts it is .10 of 1 per cent.
- Q. You told us that in your opinion the bleaching of flour by natural peroxide gas, according to the Alsop process such as was used in this flour seized in this case, impaired the di-

.gestibility—I don't now remember whether you said digestibility of the flour or of the bread—what is the fact in that regard.

A. Why, the digestibility of the bread made from the flour

is impaired.

Q. Is the digestibility of the flour also itself impaired, or have you made any experiment on that?

A. I have made no experiments on that because a man does

not usually eat raw flour.

Q. Now, I wish you would explain to the court and jury how the digestibility of bread, for example, or of any substance, may be arrived at by fermentation, artificial digestibility—I suppose that is not very clear to ordinary men not familiar with work in chemical labratories.

A. Well, in the experiments which I made on the bread, it had reference to this same gluten or protein or albuminous substances, and that digestion is all carried on in a man's stomach, that is, nearly all of it, part of it, of course, is finished in the lower intestine, and we know the composition of the gastric juice that is in the stomach; we know just exactly how it is made; so we prepared a solution of gastric juice that is identical with that of a man's stomach with the same pepsin in it, and the same hydrochloric acid contents: Then we take samples of bread that are made from unbleached flour, or from bleached flour, or anything that we want to test, and, as a matter of fact, I placed absolutely equal samples in a tube that I made. I took a test tube and cut the bottom of it off, a tube about eight inches long and about three-quarters of an inch in diameter, and I put a very fine muslin strainer over one end;

then I dropped my bread right down into that, and then 188 I could shove the tube, you see, down into my artificial gastric juice. Now, I knew just exactly how much material I had before I began my digestion; and when I had

allowed this digestion to go on for a certain length of time, I could raise my tubes out, wash off the adhering digestive solution and stop it. Then I determined how much was left. It is

a very simple process.

Q. Now, you may give us the results of your determinations.

A. First, of course, I used my unbleached flour as a standard, and I determined the nitrogen again, as being an indication, because that is the usual way we do, and I found where I had used no peroxide that it left in my tube, after my digestion was over, 1.55 per cent of nitrogen.

By Mr. Elliott:

Q. For the purpose of a possible objection I would like to ask the witness a question or two. What flour did you use in conducting this experiment?

A. With this particular one that I am reciting, it was a first patent flour made from Dakota No. 1 Northern.

2. Take different parts of that same flour bleached and un-

bleached?

A. I did, yes.

Q. How did you bleach it?

A. I bleached it in my laboratory, as I have explained.

Mr. Elliott: Counsel for claimant objects to the introduction of this testimony as not germane to the issue in this case, and as having no bearing whatever upon any possible effect the use of the Alsop process might have on flour treated by it.

The Court: Objection is overruled and claimant excepts.

A. I found undigested in the unbleached flour 1.55 of nitrogen. Then where I used 18 parts per million of peroxide I found 1.53 parts. Where I used 36 parts per million on the flour I found in the bread undigested 1.58; and where I used 72 parts per million I found 1.59.

By Mr. Elliott:

Q. What is the last number?

A. 1.59, I think it is, it is a little bit obscure; I wont be quite positive of it, I am sure there is a mistake in this table, it is 1.59, or something of that sort—1.59. But I have

189 figured over the loss in digestibility as compared between the unbleached bread and that that has been bleached. In the first case where I used 18 parts per million I had a gain of 7 per cent in digestibility, that went that way, that is, 7 per cent more of it digested, than it did where I didn't have it bleached at all. In the next case there was a loss of digestibility of 3 per cent. In the next case there was a loss of 14 per cent. Now, proceeding in the same way with this straight flour I obtained losses in digestibility respectively, 18 per cent, and 5 per cent and 20 per cent, as against the same flour unbleached and baked into bread. These losses are small but they prove the contention that the—

Judge Scarritt: I object to his statement. That is argument for lawyers to make.

Mr. Butler: It is very customary, I think, for chemists after experimentation, to express the view whether it establishes a conclusion or not.

Judge Scarritt: We object to that.

Q. Mr. Shephard, I want you to express an opinion upon this question: Does or does not the amount of nitrite reacting material recoverable from the flour measure exactly or correctly the amount of injury done by bleaching. Mr. Elliott: Your Honor, I will object to the question unless it is properly limited to the Alsop process.

Q. I mean by the Alsop process such as is admitted was used with respect to the flour seized in this case and referred to in the pleadings and defined by the testimony already in.

Mr. Elliott: I simply mean that I think the witness ought to distinguish in his answer between his laboratory bleaching and bleaching by this process.

Mr. Butler: Well, I will ask a question about that, some objection has been suggested, I withdraw this.

Judge Scarritt: And ask another in view of Mr. Elliott's objection?

Q. Some question has arisen by reason of Mr. Elliott's objection here, whether or not like results are produced from bleaching by nitrogen peroxide employed as you employed it in your laboratory, or as employed by the

Alsop process which you have described. I will ask you whether or not there is any difference in the effect in the flour?

A. No, the results are identical.

Q. Now, I will renew my question, whether or not the amount of nitrite reacting material recoverable from flour is a true exact index of the amount of damage done by the bleaching by the Alsop process?

Judge Scarritt: We object to that as not being a proper expert question, invading the province of the jury. To ask him what effect each one of these processes has, it seems to me would be proper, but for him to conclude and decide just exactly what the jury has got to decide, is improper and invading the province of the jury.

Mr. Butler: I am sure from Judge Scarritt's objection that I have not made my meaning perfectly plain in the question.

Judge Scarritt: Possibly not.

Mr. Butler: My point is this-

Judge Scarritt: I thought you were going to ask another question, I thought you were; I would like to have a ruling on that as it stands row unless he withdraws it and asks another one.

Mr. Butler: You didn't understand it the way I intended it, and I am sure it is the fault of my question, and perhaps I had better try again.

The Court: That question is stricken out from the record. Put it again.

Q. I received the impression from your testimony this morning that nitrites are recoverable from bleached flour, and that the amount recoverable varies under varying conditions and the lapse of time. Now, given a specimen of flour which has been bleached, which is found in the market without knowledge of its history, the amount of nitrogen peroxide,

used, the time of using it, with respect to the time of
191 examination, then I ask you whether or not analyzed
at that time and the recovery of nitrite reacting material will be a true index of the amount of damage inflicted by
the bleaching? That is what I was trying to get at.

Judge Scarritt: That is calling for an opinion—expert conclusion. It is a matter for the jury to decided; he can tell what effect it would have at that time, but how much damage was done is purely a question for the jury; that is the very proposition that they are here to decide.

By Mr. Butler:

Q. I did not mean damage in the sense of dollars and cents, but I mean injury.

Judge Scarritt: The question of adulteration is before this jury; that involves the decision of that question; the answer to that question involves the decision.

The Court: Objection is overruled and claimant excepts.

Witness: The amount recoverable under such circumstances would be no index to the amount of peroxide employed.

Mr. Elliott: I object to the answer as not responsive to the question, and move to strike it out.

Mr. Butler: Well, I will ask another question to cover that.

The Court: I understood he was going to ask another question.

Mr. Smith: That leaves that one in the record. Our motion to strike out has not been passed on by Your Houor, and he has not withdrawn his question.

The Court: It will be stricken out.

By Mr. Butler:

Q. My question was to the extent of damage, and not the

amount of nitrogen peroxide gas used.

A. I apologize, I had another thing in mind. My answer to that is that it is no index to the amount of damage done to the flour.

Q. How about the question whether or not it is an index to the amount of nitrogen peroxide gas used?

A. Not under those circumstances, a man couldn't tell

anything about it.

Q. Have you determined whether or not nitrite reacting material which was added to flour by the Alsop process is or is not all soluble in water?

A. I have not determined that one point strictly as that, but I have determined that it is not all recoverable by solution in water, we cannot recover the theoretical amount.

- Q. That is what I mean. Have you ever made any study or examination to determine the effect upon wheat of nitrogen peroxide gas from the enzyme in the wheat, or enzymotic action or diastase? A. Not on the diastase of wheat.
  - Q. Or the flour?
- A. I have on the diastase of barley, not of wheat or flour. not of wheat.
- Q. Well, from your study have you an opinion with respect to that as concerns wheat; that is, would your determinations in barley be enlightening as to the enzyme as respects wheat?
- A. Why, there is practically no difference between the two diastases, barley and wheat.
- Q. Explain that to the jury, explain what is meant by diastase.
- A. The diastase of the grain is what I told you was that enzyme that will change the starch into sugar so that when the plant sprouts it can eat up the starch, consume the starch that is in the berry.
  - Q. Now, what is the effect of gas on the diastase of wheat?

Counsel for claimant object because no proper foundation having been laid and the witness not showing himself competent to testify. The court overruled the objection; to which ruling claimant then and there duly excepted.

A. I found that where I used 80 parts per million of nitrogen peroxide that it prevented the diastase from acting, I could not get any digestion at all. Where I used 40 parts of peroxide per million, that there was a delay in the action of the diastase as compared with one where no peroxide was used, of 121 per cent.

Q. That is, as I understand it, 80 parts per million of this gas, nitrogen peroxide gas, inhibited digestion?

A. 80 parts per million, yes, sir.

Q. And that 40 parts per million increases the time 93 120 per cent, is that it? A. 121.

Q. It would all digest, but it takes more than twice as much time, is that the idea? A. Yes, sir.

Q. 121 per cent? A. Yes, sir.

Q. The amount of nitrogen peroxide gas employed in those divers cases in your determination was 80 parts per million, 80 per cent of nitrogen peroxide gas to a million parts of what?

A. A million parts of solution; that indicates the concentration, the strength of it. That would mean just the same as when we say of the flour that we had 80 parts of the peroxide to a million of flour.

Q. Parts of flour? A. Yes sir.

Q. That is what I was trying to get at, whether or not the relation in quantity which was used was the same in terms as in case of bleaching flour. What would be the standard, it has been suggested to me, between 80 parts nitrogen peroxide per million of this solution to the amount of nitrogen involved?

A. I hardly think I understand your table; that is, you mean nitrogen regained as nitrite nitrogen, is that what you

want to know?

Q. I don't know, the chemist asked me to ask the question, I don't know what he is talking about, I am not sure—nitrite

nitrogen, that is what he wanted.

A. The exact divisor we would have to divide the 80 in the 40, the exact divisor would [—] [46/14th]—about 3.4—well, for practical purposes we might divide say, by four, that would give it 20 parts, 20 parts of nitrite nitrogen in case of 80, yes, and 10 parts of nitrite nitrogen in case of the 40.

Q. Are you familiar with the market prices or the relation between the market prices of patent flour and straight flour and clear, so as to be able to tell us whether or not one is higher

than the other?

A. The patent flour commands a premium over clear flour, varying sometimes, sometimes as much as seventy-five cents a barrel.

Q. And that is over clear flour? A. That is over clear.

Q. How about straight?

A. Well, it varies again, sometimes 20 and sometimes 30 cents a barrel more.

Q. That is, the highest price, then, is patent, and the next is straight and the next is clear, am I right about that?

A. Yes.

Q. Now, as to the effect upon the general appearance and the effect of bleaching by the Alsop process upon the general appearance of straight flour, does it or does it not make it: look to ordinary observation, like a patent flour, especially as respects color?

A. Yes, sir, the straight flour can be made to resemble pat-

ent by bleaching, and, in fact, the bleaching wipes out all distinctions of grade as determined by color.

Mr. Elliott: I object to the last part of the witness' answer, it is purely volunteer, and move to strike it out.

The court overruled the motion to strike out; to which ruling claimant then and there duly excepted.

Q. In the absence of bleaching is the color of wheat flour an index to its quality and kind?

A. It was before bleaching was introduced an index of the quality and kind of flour.

Q. What effect does the Alsop bleaching process have upon color as an index of the kind and quality and value?

A. Destroys the index.

Q. How so?

A. Because it makes all grades of the same color,

Q. And how with respect to flour as you consider different kinds of wheat, new or old wheat, hard and soft?

A. Well, they can all be reduced to uniform color.

The Court: Speak up, Doctor.

A. They can all be reduced to a uniform color.Q. By this Alsop bleaching process? A. Yes, sir.

Q. This morning you expressed the opinion that bleached flour, when bleached by this Alsop process, would not improve by being stored and by lapse of time as would the unbleached flour. Will you give us the reasons for that opinion, tell us why that is true?

A. On account of the injurious effect on the diastase or the enzymes of the wheat. Of course I could conceive a case where the flour might be bleached to such a slight extent that there wasn't enough peroxide to paralyze all of the enzymes, but usually there is sufficient for that, and if the enzymes are put out of business, why, there cannot be any improvement.

Q. The improvement, then, in case of color, aging, is due to enzymotic action? A. I think it is,

The Court: Anything further, Mr. Butler, in chief?

Mr. Butler: That is all I can think of, Your Honor.

## Cross-Examination

By Mr. Elliott.

Q. Professor Shepard, I will ask you first what particular line you qualify as an expert to testify in this case?

A. Why, I have qualified as an agricultural chemist to do digestion work.

Q. Solely as an agricultural chemist?

A. That involves, of course, the idea of this digestion work as I have explained.

Q. You don't qualify as a toxicologist, or doctor of medi-

cine, or anything of that kind? A. Not at all.

Q. I will ask you if for the purpose of your experiments you have ever gone to a mill and gotten flour bleached by the Alsop process, and the same flour unbleached?

A. I have not.

Q. In regard to this Exhibit No. 6 I will ask you if you know how the color of the gas that was originally in there compares with the color of the gas that comes from the Alsop process or the Alsop machine?

. The colors would be identical if the dilution were the

same.

Q. Just repeat the question. (Question read by the re-

porter.)

A. I will try the answer again. The color of the gas which I brought in is darker than it would be as it issues from the generator of the Alsop machine.

Q. Did you ever see gas coming from the Alsop machine?

A. I have.

Q. Have you ever seen its color? A. I have.

O. You detected it?

A. I could detect the color and I could detect the-

196 Q. You say that you have seen the color of gas coming from the Alsop machine? A. Yes, sir.

Q. What color was it?

 It is a very faint, a very faint shade of this same brown color.

Q. Where was that?

A. That was in the mill at Minneapolis.

Q. What mill?

A. In the Washburn-Dean mill and also in the mill at Brookings.

By the Court:

Q. Dakota? A. Dakota, yes, sir.

By Mr. Elliott:

Q. Now, you have testified that peroxide of nitrogen gas produces—has certain properties, that is corrosive and that is difficult to breathe, suffocating to breathe, and so forth. Have you ever smelled the gas from the Alsop machine?

A. I have.

Q. Did you experience any suffocating effects?
 A. Why, an irritating effect in that dilution.

Q. You did? A. Yes, sir.

Q. You don't understand, however, do you, that the buyers

of flour that has been bleached by the Alsop process have to inhale this peroxide gas, do you?

A. No, not at all.

Q. And your testimony has been that assuming that the peroxide gas is the element which bleaches flour, that it is changed in the flour to something else, isn't it?

A. With the lapse of time.

Q. Then if it be the fact that peroxide of nitrogen gas is poisonous, that has no necessary bearing, has it, on the property of any compound that may be found in the flour bleached by the gas, has it?

A. Why, in that the nitrous acid derived from it is there.

Q. But that assumes that nitrous acid is poisonous, but I say the fact that the gas is poisonous does not necessarily imply that the product you found in flour is poisonous, if it is changed, doesn't it?

A. But it is not always changed; perhaps, we do not

understand each other exactly.

Q. Well, I will ask it plain. A. I make this statement—
 Q. Let me put the question to you. You have testified
 that the peroxide gas comes into the flour and is changed into nitrous and nitric acid? A. Yes, sir.

Q. Those are both distinct chemical substances from per-

oxide of nitrogen? A. Yes, sir.

Q. Now, irrespective of whether either of those substances are poisonous, I will ask you isn't it a fact, or is it, I will ask you if the fact that peroxide of nitrogen is poisonous necessarily implies that the products it forms in flour is poisonous, if it is changed? A. Why, it does not imply that.

Q. Now, that is all I want to know. You have said that

those things were poisonous? A. Yes, sir; I claim-

Q. But what I am getting at-

Mr. Butler: You interrupted the witness and I hope that he may be permitted to conclude his answer.

The Court: It is for the witness to say whether he has answered it completely or not, I don't know.

By Mr. Elliott:

Q. What I am trying to merely bring out is this, Professor Shepard. You have stated that certain properties are possessed of peroxide of nitrogen gas? A. Yes.

Q. And I am simply saying that whatever these properties may be, it does not necessarily follow that they are possessed

by the different compounds in the flour, does it?

A. Theoretically it does not, but as a matter of fact, it does follow, Mr. Elliott.

Q. All right. We'll get to that later.

A. Yes, all right.

Q. But as a mere question of theory it does not follow at all, does it? A. Not at all.

Q. In other words, to illustrate, chlorine is a poisonous and corrosive gas, isn't it? A Yes, sir.

Q. It does not necessarily follow that table salt is poisonous, does it? A. Not at all.

Q. And that is a compound?

A. That is a compound of chlorine.

Q. From chlorine gas, isn't it? A. Yes, sir.

Q. And carbolic acid gas is poisonous when inhaled, isn't it? A. Yes, sir.

Q. It does not necessarily follow that the compounds of that gas are poisonous, does it? A. Not at all.

198 Q. As a matter of fact they are not poisonous?

A. No, I have admitted all that, Mr. Elliott; I have admitted that theoretically it does not follow, and you name cases where it does not, to prove my answer correct.

Q. Now, you have testified about this gas generated by the Alsop machine corroding the pipes. Where did you see

that?

A. Well, I have seen that in specimens of pipe that have been taken from the mills.

Q. Who got the specimens?

A. Well, I saw those in North Dakota; I couldn't tell you just who brought those in; and I have seen pipes that came out of our mill at home that were corroded, and so on.

Q. Well, did you get those pipes out of the mill?

A. Oh, not at all, it was just casual.

Q. Have you seen a pipe in a mill that was corroded?

A. Sir?

Q. Have you seen any pipe in a mill employing the Alsop process that was corroded?

A. That is you mean where I went and took the pipe out and handled it, and all that?

Q. Did you see the pipe and see that it was corroded?

A. Well, I couldn't see where I have visited the mills, the pipes were in use, you couldn't see because the corrosion is on the inside; there is only [—] way,—to take the pipe out and examine it.

O. You never did that? A. That I did not do, no, sir,

Q. As a matter of fact, if you pass ordinary atmospheric air through that pipe it would corrode it, wouldn't it, in time?

A. Well, it would be too long for you and me to wait, Mr. Elliott.

Q. You don't know how long it takes this Alsop process gas to corrode it, do you?

A. Why, I have not taken a pipe and put it in and fol-

lowed it through, but of course I am obliged to rely for my knowledge of that on the statements of those who use them.

Q. It is not in evidence here, I am asking you if you know how long a pipe may be used with the Alsop machine without corroding?

A. Well, it will depend on the thickness of that pipe; you can make a pipe thin enough so that it won't last a month with the Alsop process.

Q. You don't know that, though, do you, you have never seen it?

A. Why, I have not made that measurement, no, but I know it.

Q. You don't know how long a pipe may be used with the Alsop machine without corroding, do you; you don't know if it may be used five years or ten years, or twenty years, do you?

A. Well, I know that it cannot be used any such length of time.

Q. Well, how do you know it?

A. I know it because I know the action of chemicals on iron and on the different metals.

Q. Yes, sir, you know what the action of gas on iron is, don't you? A. Yes, sir.

Q. There is pressure in the air? A. Yes, sir.

Q. And that would corrode the pipe too, wouldn't it?

A. Yes.

Q. You don't know how long a pipe would last under mere atmospheric conditions, do you?

A. No, I don't know how long a pipe would last under

atmosphere.

Q. You don't know how long a pipe would last from this Alsop machine, do you?

A. I find it does not last but a little while.

Q. Well, how do you know it?

A. Well, because, as I have explained to you, from the samples that I have seen taken out of a mill.

Q. But you don't know anything about those samples. I am asking you for your information, how do you know?

A. Why, I told you a moment ago, Mr. Elliott, that I never went into a mill and put in a pipe and then examine it, and by and by went and took it out or removed it when it was corroded and destroyed. Now, I have admitted all that.

Q. Then you don't know; that is fair, isn't it? Now, you have seen an ordinary rain spout that has been corroded and

rusted and full of holes, haven't you? A. Yes, sir.

Q. And it is perfectly evident that iron pipe will corrode by passing air, or air with moisture in it, through them, wouldn't it?

Q. Yes, with air moisture they will corrode.

Q. Have you ever found any nitric acid in flour bleached by the Alsop process.

A. I never made a test for nitric acid.

200 Q. And you never found any nitric acid in flour?

A. No, sir; I never found any in there.

Q. And it would inevitably follow that if there was nitric acid imparted to the flour by this process, that the acidity of

the flour would be materially increased?

- A. It would depend on the nitric acid; if it went in combination with the gluten of the flour, the acid could not be increased at all because it would form a chemical substance, but if you put in enough acid so that you have passed beyond the compounding contents you will increase your acid right away.
- Q. You testified, did you not, that the probabilities were all against a combination of nitric acid and nitrous acid, that any passed in the flour, don't you?

A. No, sir, I did not.

Q. You did not? A. No, sir, I did not.

Q. Didn't you say-

A. Excuse me, I tell you what I said.

Q. Let me ask the question. I understood you to say in answer to a question from Mr. Butler in explaining the disappearance of the substance from the flour, that combinations might account for the disappearance of some of those nitrites, but that in your judgment the probabilities were against com-

bination. Now, is that correct?

- A. Now, we were talking,—now, let's understand each other exactly—we were talking at that time about nitrous acid, or nitrite reacting material, and my recollection is that Mr. Butler asked me what became of that, why it constantly disappeared, why we could not recover it after a while; and I made the statement that the probabilities are that this nitrous acid does not go in combination with any of the materials of the flour, to any large extent, perhaps bearing some metallic substances, which I qualified when I came back again, but that this nitrous acid is carried on, this splitting up process regenerating nitrogen peroxide again, and once more losing half of its quantity by half passing into nitrie acid and half into nitrous acid.
- Q. Well, did you or did you not testify that the probabilities were against the formation, the compounding of nitrous acid that passes in the flour?

A. Yes, sir, I said that the probabilities were that there was very little of that going on, yes, sir, that is right;

I want to go on record as having said that.

Q. Now, I want to get again, because I think we have a right to know something about this milling process, your idea

of the milling of wheat and the grades of flour that are produced from wheat, such as you gave Mr. Butler; I did not quite make notes of it, and I want to get your idea once more. Now, will you please start with the break rolls and tell me what is produced by the grinding of the wheat.

A. When the wheat goes in the break rolls, as I explained, it is broken into coarse granules, a very large portion of

the grinding portions are separate.

Q. The break rolls are corrugated?

A. The break rolls are corrugated, yes, sir.

The Court: Recollect, Professor, that everybody here has a right to hear what you say.

By Mr. Elliott:

Q. Just tell us what the break rolls are, first,

The break rolls are corrugated rolls and the first rolls into which the flour is passed here, the whole wheat is broken up, the bran is largely separated, the inner portions, the harder portions of the wheat are made into coarse grains, as I explained, and this is called the middlings, and it is from the middlings that the patent flour is made, made by subsequent reduction on finer break rolls and taken in connection with the smooth rolls, as I explained. There is also a little starchy or a little break flour, a little white flour, produced then on the very first break rolls; that is, according to the custom of the mill, sometimes run into the patent flour. After the patent flour has been extracted by regrinding to bran, and that portion of the middlings which does not go into the patent flour, we get clear flour. After the clear flour is taken out there is something very near like food, that we call "red dog" flour. I further made the statement that where all the flour except the red dog flour is run-all streams united, and all put into one sack, where the total capacity of the wheat is made into one flour, we call that straight flour, that

is what I mean by straight flour.

Q. Now, when you say all the flour, does that include that red dog, that that goes in to make it straight?

A. I said exclusive of the red dog.

Q. Exclusive of the red dog? A. Yes, sir.

Q. And you speak of the patent flour. Now, where did that come from?

A. I explained a moment ago again that that came from the purified middlings.

Q. Does all of the purified middlings make patent flour?

A. Not all of it, no.

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Q. Well, how much?

A. Well, that depends on how the miller is grinding, whether he is making a long patent or a short patent or what he is doing.

Q. Well suppose he is making a long patent.

A. Well, some have used as high as seventy-five per cent of all the flour that they can get as a patent flour, that is 75 per cent of all the flour that can be produced, and call it a patent flour. I think that around about 60, 50, 60, 65 is more near the average, although some from choice patents only have about 55 per cent of all the flour that the wheat can produce; and I will state again, that as a rule after some of the patent flour, after the patent flour is removed from the middlings, that still a quantity of clear can be obtained.

Q. From what?

A. From the middlings, from the remainder which does not all go—the whole middlings does not all go into patent flour, but it is a matter of custom, and each miller grinds according to his own ideas.

Q. Well, that is just the point I want to bring out. You did not mean to say any hard and fast rule, did you, for pro-

ducing any one of these grades?

A. No hard and fast rules, Mr. Elliott; that was limited by a difference, we will say, of three or four per cent either one way or the other, or four or five per cent; but if a man has such a wide difference that will amount to, for instance, here a 55 per cent makes a good patent flour out of a certain grade of wheat, if that man runs in 80, he has got too near a straight to be a first-class patent, such wide variations as

that I would not stand for, but there is no standard. Q. What do you mean by you "would not stand for"?

A. Well, I mean I would not accept it as a patent flour.
Q. Now, irrespective of the question of bleaching, it is a fact, isn't it, that new wheat is ground and new flour is sold?

A. Yes, sir.

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Q. That inevitably occurs in the ordinary business of milling? A. Yes, sir, that is true.

Q. I will ask you what is the conditioning of flour, what is the conditioning of flour?

A. The natural conditioning of flour means a storage under proper conditions of temperature and moisture, that is, I mean stored in a dry place, warm place, and allow it to remain there for the natural action of the flour to take place and improve its quality.

Q. Now, take a flour that has been naturally aged and conditioned, I will ask you what changes, are you able to determine, have taken place in that flour as compared with the new flour?

- A. Yes, sir, we can determine some of them; I know some of them are well known.
  - Q. My question was what changes? A. What ones?

Q. Yes. A. Well, one for color.

Q. One is color? A. The color is decreased somewhat.

By Mr. Butler:

Q. I did not get the answer, Mr. Reporter.

A. The color. I say the color has decreased somewhat; that is, it has grown lighter in color. Second, for flavor; the flavor of the flour has improved by the natural aging, the natural conditioning.

By Mr. Elliott:

Q. How do you determine that?

A. That is determined by the aroma of the flour that an expert can get.

Q. What do you compare it with?

A. Compare it with itself, just the same as you compare the odor of a rose with itself; we haven't got any comparative odors now, there are no names for odors, Mr. Elliott, you must remember that the English language does not give us any name for odors; we have to compare, if we undertake to tell about an odor, we have to compare it to something else; you cannot describe the odor of a rose.

Q. No, no, you misunderstood me. You say the odor

204 of the flour has improved? A. Yes.

Q. Now, I mean what flour have you got to compare that with to show the improvement?

A. As against the raw flour.

[A.] How are you going to make the comparison; you cannot keep the raw flour as it was when it was milled, can you?

A. But a man that is in the habit of handling the raw flour will get an idea in his head just as taster of tea, and things of that kind, he can tell those things, and by and by, and if he is in the habit of tasting and comparing these aged flours, he can tell in that way, it is an acquired taste, it is an acquired art, Mr. Elliott, I will admit.

Q. What is that?

A. I say a man can acquire it by practice.

Q. What else now can you detect?

A. The next improvement is an improvement in what we call the quality of the gluten, the quality of the gluten, the elasticity.

Q. How do you make that comparison?

A. Well, that comparison is made, the quality of the gluten is sometimes made by doughing the mixture and pulling it, working it with the fingers to see whether it is sticky or not, or whether it is clean or how resilient it is if you stretch it

out how much will come back, and things of that kind; and then again there is another way that we have of testing in the laboratory is by—

Q. No, I am not speaking about the chemical test, I know that: I mean what flour have you got to compare it with?

A. Well, you must compare it, of course, with the raw flour.

Q. And you haven't got the raw flour to compare it with?

A. Not right there at that time, but Mr. Elliott, if you are in the habit of handling these raw flours and making these tests, and also in the habit of handling the aged flours, a man's dictum is good.

Q. Well, what else can you discover; what other improve-

ment? A. Well, that practically covers it, Mr. Elliott.

Q. Now, chemically you can say that the flour is lighter than—that the naturally aged or conditioned flour is lighter in color that is one thing; and you can also chemically determine that it has less moisture in it, can't you, that is you can take the moisture contents of the new flour and make a record of it, and six months afterwards, or whatever the time may be, you can take the moisture contents of the naturally aged flour and make a record of it?

A. Yes, but your question implies something that does not always occur, that is what I was thinking about; if your flour is stored away where it can have free access to moisture, that is, if your atmosphere is moist, your old flour may have more

moisture than your new, that is.

Q. Under those conditions you say the flour would improve? A. Yes, sir, it would improve.

Q. It would? A. Yes, sir.

Q. If it does contain more moisture than it did when it was new?

A. It was improved in these other respects, but in the respect of having more moisture that would not be an improvement.

Q. No, but I mean absolute, if that new flour at the end of the storing period contained more moisture than the new flour, you say that it would be improved or could be improved?

A. Well, now, we have come to the limitation question again. In that one respect it would not be improved, but in the

others it would.

Q. Well, let's get at the absolute facts. Isn't it true that in nearly all cases naturally aged and conditioned flour has less moisture than the new flour?

A. The tendency is that way if it is properly stored,

Q. And those are the only two things which scientifically you can say occur? A. What about the gluten and strength?

Q. You haven't anything to compare that with, but I say

scientifically you can say that the color is lighter, and think it has less moisture. Now the gluten may be improved in quality by the loss of that moisture; may it not; in other words, a loss of the moisture may account for the improvement of the gluten, may it not?

A. I don't think so, sir, no, sir.

Q. Well, why not?

A. Why, because when we make that gluten into dough, whereas we only have say about ten per cent of moisture in our flour, we put in enough water there so that our dough will carry thirty or forty per cent of water, and then when we come to expand it, when we come to expand it, why, certainly, the amount of water that was in there is insignificant as compared with the total amount of water almost.

Q. Well, here is what I am trying to get at. We know what you say, and it is admitted that naturally aged flour is improved. Now, I say the only two facts about it that you can scientifically prove is that it is lighter in color and has less moisture. Now, if the gluten is improved you don't know how that occurs, or why it is improved, do you?

A. Why it improves?

Q. Yes, sir. A. I think we do.

Q. Well, tell us.

A. Why, I think like this, I think by the enzymotic action going on that the gluten is modified, and it is rendered more elastic.

Q. Yes, sir, Doctor Shepard, others have different thoughts. I am speaking about what is scientifically known, has anybody—now I ask you this question—has anybody been able to state what occurs when flour conditions, or what makes it improve by age?

A. Well, I have stated to you fairly what I considered, and if you have got others that have different views, I suppose they are welcome to give them here, but I do not care to change my

expression or views, Mr. Elliott.

Q. I have not understood that you have stated why, the

conditions you have stated, the facts? A. Yes.

Q. And that you think something, but I say can you controvert this proposition that the only two chemical facts or scientific facts that have been ascertained are that the condition of the flour is whiter in color and has less moisture in it. Now, can you controvert that?

A. Oh, well, there have been plenty of experiments made along that line; I have not made those experiments myself, but, Mr. Elliott, every housewife in the United States that has ever been baking flour knows that the baking quality of

that flour is improved and the gluten is improved.

Q. I do not dispute it for a minute, but I am asking 207 you, can you controvert this statement that the only two ascertained facts that any man can testify to is that it is lighter in color and has less moisture than the new flour?

A. Well, the improvement of the gluten must remain; I

must insist on that.

Q. We assume that it is improved, but I am not asking for the reason of the improvement. Those are the only two facts that are known, are they not?

I told you once that we know that the gluten is im-

proved.

Q. And I admit that.

Well, then, I don't see what we are talking about, Mr. Elliott, we seem to be agreeing.

Why does the gluten improve? Q.

I tried to tell you a moment ago that owing to enzymotic

action that it had been improved in its elasticity.

Yes, Professor, perhaps we are beating around the bush. I simply want to show this: We will admit that naturally aged flour is better than a new flour for its baking purposes; let's admit that. A. Yes.

And I say we know that the conditioned flour has less moisture and is lighter in color. And won't you admit that it is better in flavor too? We are admitting an improvement: let's admit it is better in flavor, all right; now, I am just coming to the why, I simply say the only two scientific facts accounting for that improvement, are, one, the loss of color which we can attribute to what we please, and second, the loss of moisture. Now, do you controvert that; if you do we will drop it?

A. I don't agree with you, Mr. Elliott. We cannot agree

if we talk all day, but we will have to quit.

Q. Now, do you wish to be understood as testifying that aged flour is always better than new flour?

If made from the same grade of wheat, ves.

Any given time in the market can you get new wheat or new flour that may make better bread than old flour that is already on the market?

A. Yes, because you might have had some old flour 208 that was so awful bad when it was milled that it never would be improved by aging, and you may get a new flour that was very good indeed, and thus make you better bread.

Q. You admit the possibility?

But we will go right back to my statement to you, and that covers it fairly, Mr. Elliott, and that is this, that if the flour is made from the same grade of wheat, the aged flour is always more valuable than the new flour.

Q. Isn't it true that, or do you know this, that oftentimes on the market new flour will bring a higher price than aged flour?

A. It might, because some years we have a bad crop of wheat and the wheat is all bad, and the flour made from that is not desirable; the next year we may have a good crop of wheat, a good quality of wheat.

Q. I don't want to interrupt you, but is it true that new flour may sometimes be lighter in color than the old flour on

the market?

A. Under the circumstances that I have just given, that is true, when you have one year a bad crop, and the next year a good one, your bad wheat always shows up to disadvantage, even though it is aged.

Q. What is the color of the flour made from the wheat of South Dakota as compared with the color of the flour made from the wheats of Kansas and Nebraska and Iowa and Mis-

souri?

A. The wheats of the states last mentioned are all darker in color. I am talking of the natural flour, that is what you want to know?

Q. Yes.

A. Without bleaching or anything. They are considerably darker in color, contain quite a few more parts in the orange and also in the yellow.

Q. Now, I understood you to testify that in reference to bleaching that depending upon how it was handled?

A. Now, once more, Mr. Elliott.

Q. Depending on how it was handled?

A. The first part of it, I beg pardon, I didn't catch.

Q. Flour may be chalky white. Now, just explain what you mean by that.

209 A. I mean by that where the tints of orange and yellow have very nearly disappeared; that point can be reached.

Q. What did you mean by "depending on how it is handled"?

A. That is whether—it is whether or not peroxide has been put in to reach that point or not.

Q. Yes. Well, you say chalky white was a desirable color?

A. I didn't say anything of the kind.

Q. I am asking you.

A. No, sir; I say it is an undesirable color.

Q. Is it a very undesirable color?

A. To my notion it is a very undesirable color, yes sir.

Q. And if a miller can bleach his flour so as not to give it a chalky white color, if it is an undesirable color, you see any reason why he should do it? A. I can't see any reason why he should but as a matter of fact he often does.

Q. All right-

A. And I sympathize with the miller that does it; it is

because somebody wants to have white bread.

Q. If you will just confine your answers to my questions, i'rofessor Shepard, we will get along very much faster; I don't think there is very much disagreement between us. A. No.

Q. You say this thing can be handled to give it a chalky

color, this process? A. I do.

Q. Which means that you need not give it a chalky color if you get it right. Now then I will ask you if, that being the fact, you could see any reason, why a miller should give his flour an undesirable color?

Mr. Butler: This is improper cross-examination, because wholly irrelevant.

The Court: Objection sustained.

To which ruling of the court claimant excepts,

Q. I understood you to say that by this bleaching process the clear flour may be made lighter in color; is that correct?

A. Yes, sir, that is true.

Q. How does the clear flour differ from the so-called patent flour? A. In what respect differ, in which?

210 Q. In quality? A. In quality?

Q. Yes, what makes it clear?

A. Now that word "quality" is so inclusive, Mr. Elliott, that I hardly know how to answer your question.

Q. Well, take the hypothetical mill you were talking about?

A. Well, in the first place, of course, its color is not quite so good, that is comparing it with the patent, and then again, why, sometimes it might have more protein in it than the patent, and it does not have quite so desirable an appearance as the patent flour; really, the clear flour is not such a bad flour from a nutritious standpoint.

Mr. Butler: Speak a little louder if you can, Professor.

A. I will try.

By Mr. Elliott:

Q. Well, perhaps I misunderstood you, but if that may be equally nutritious or more nutritious than the patent flour, if a man bleached his clear flour and makes it this patent flour he would be making a better flour, wouldn't he, by adding more nutriment to the flour?

A. No, he would be adding a lower grade a lower value

of flour to the higher grade of flour just the same.

Q. Now I don't care which way you look at it. Why is it a lower grade then?

A. Because it brings a lower price, it is a foolish thing, there is no reason on earth for it but it is a fact you know.

Q. There is no reason for the fact?

A. No, there is no reason.

Q. In your judgment.

A. Excepting as I explained, that it might not make so desirable a looking loaf in a man's estimate who wants a dry white loaf.

Q. Well, do you mean that it is only inferior to the patent because it is not as white in color?

A. I mean that it is inferior to the patent because it does not bring so good a price, Mr. Elliott.

Q. Oh well, that shows it may be, but I am asking your

opinion why you say it is inferior to the patent?

A. Well in that respect it is inferior in that it does not bring so high a price on the market, you could not sell it for as much.

Q. Then tell us why you think it does not bring as high a price on the market?

A. Simply because people don't want it.

Q. Then why don't they want it?

Counsel for the Government objected.

A. Well, I declare I don't know why. I can't tell you why nor why the people don't want it; I can't tell you why.

Mr. Butler: I doubt very much that is proper cross-examination.

Mr. Elliott: Well, I think it is very germane.

The Court: Why does corn meal not bring so much as flour and so forth? I don't believe that is a subject of expert inquiry.

Mr. Elliott: Corn meal is not flour, is not wheat meal.

The Court: No, I learned that a good while ago but that would not get at that. I have just said, how can that be a subject of expert inquiry. Some men prefer corn meal, some rye, and some wheat, and some one thing and another.

Witness: I couldn't tell why.

The Court: Just hold on. That is not a subject of inquiry. I don't think of this witness,

Mr. Elliott: Your Honor, the witness testified-

The Court: Now here these entire inquiries are here within three brief paragraphs of Section 7, to which Mr. Butler directed himself and it is not for the court to even suggest what he has meant by it. The things I am going to submit to this jury are within Paragraphs 1, 4 and 5, under the grand division of Foods, of Section 7, jumping drug and confectionery, and getting down to foods. Of course, you and I know what those three things are. If they bring this within either one of those three paragraphs, the verdict will be so and so; if they do not the verdict will be in your favor. Now then how can it be a subject of inquiry by this gentleman; he says that he has had scientific knowledge, education and experience, how

can you cross-examine him with reference to markets, 212 or getting into the field of bulls and bears not into the

laboratory, it seems to me like.

Mr. Elliott: Not at all. Do I understand your Honor to say I may not?

The Court: I sustain the objection, yes.

Mr. Elliott: We note an exception to that.

By Mr. Elliott: (resuming)

Q. Assuming that all so called clear flour contained certain impurities, that is branny particles or other impurities, is it your opinion that the bleaching of flour, would conceal or make prominent those impurities in the flour?

A. That is whether it would bring it out? It would em-

phasize the presence of the branny particles?

Q. Yes, sir.

A. If it was pushed far enough, I believe it would, Mr. Elliott, but I think—my experience in that has been like this, that if it is judiciously done, that that flour can be treated, and then by mixing it, as is often done with that clear flour, with some other grade of flour, the whole thing goes as high patent.

Mr. Elliott: I move to strike it out.

The Court: I believe, Professor, that you ought to focus your mind on the question, and when you answer, why, then wait for the next question.

A. All right.

Mr. Elliott: I move to strike out the answer of the witness, and I will ask it over again.

The Court: I will leave it go, but you may commence again on the subject, it goes out.

Q. Now I will ask you if it is your judgment that if a so called clear flour contains particles and is bleached, if the presence of branny particles would not be more apparent after the bleaching than before?

A. Not unless too much bleaching had been used, Mr. 213 Elliott; by bleaching very carefully it would not em-

phasize their presence.

Q. Is it your judgment that branny particles are bleached

by this process? A. I don't think they are.

Q. Then if this flour we are talking about, the flour content, is made whiter, wouldn't it necessarily follow that the branny particles would be more prominent?

A. Well, theoretically you are right, but practically, as I have explained, if the thing is done carefully, why it is not necessary to emphasize the presence of the branny particles.

Q. I don't understand what you mean by being done carefully, I am assuming that it is bleached, commercially bleached I will say, assuming that the clear flour is bleached at all, doesn't it follow, that the whiter you make the flour the more prominent you make the branny particles of it?

A. Well, that would be true as you state it that way.

Q. I believe you have testified as to the probability or possibility, I don't know which, of nitrites and nitrates being formed in flour by this process? A. Yes.

Q. I will ask you if you have ever obtained or isolated any nitrites or nitrates as such, from any flour that was bleached by the Alsop process? A. Yes, sir, I have.

Q. Tell me when that was and how you did it?

A. That was some flour that was sent into my laboratory during the time that I was doing the pure food work. Prof. Lott sent me several samples—

Q. Well, one moment now. I must object to that answer; you don't know where Prof. Lott or anybody else, got the flour

that was sent to you.

Mr. Butler: Wait a moment, Mr. Elliott, please. This question calls for this answer, as I caught the question and answer, and it seems to me he ought to be permitted to answer the question, or the question ought to be withdrawn.

The Court: Were you through with the answer.

Mr. Elliott: The first question asked this witness was if he had ever taken any flour bleached by the Alsop process and comparing it with the flour unbleached, for the purpose of experiments, and he said he had not. Now

214 purpose of experiments, and he said he had not. Now I ask him if he has ever procured or isolated from any flour bleached by the Alsop process nitrites or nitrates as such? A. I answer in the affirmative.

Q. Well, where did you get the flour?

A. I got, I remember, one sample in bread that I procured at our mill there in Brookings. I had other samples that were sent to me labeled and marked, and admitted Mr. Elliott, [you] have been bleached by the Alsop process, by you, and by every one else in the North Dakota trial. While my investigations along that line have not been so large as they have where I did it myself, I can say truly that I have isolated a nitrate acid from flour bleached by the Alsop process.

Q. My questions was nitrites?

A. I said nitrites.

Q. I understood you to say nitrous acid?

A. Well, it is all the same thing, that is practically, whether it is nitrogen nitrite or whether it is some other form, why, we are speaking of it all as nitrite reacting material.

Q. Now let me ask you this-don't you know as a chemist

that nitrous acid has never been isolated by anybody?

A. Not in a pure state.

Q. All right, then you did not isolate it, did you?

A. You are not using your terms right, are you?

Q. I think so.

A. Now let's understand this now if you are using your terms right.

Q. You answer my question—my terms of nitrite first; did you ever isolate and take out of any flour bleached by the Alsop

process any nitrites?

A. I say using the term as extracting, that is, if I ever extracted any of these substances, I reply to that question, yes. Now if you ask me if I isolated it from that, I say, no, or no living man ever has.

Q. Did you ever take out of or procure from or isolate from

any flour bleached by the Alsop process any nitrates?

A. I told you that I never had tested those for nitrates, yes, sir.

Q. Then so far as you are concerned the existence of nitrites as such and nitrates as such, in flour, is pure theory, isn't it?

A. Well, I want to think about that question a moment.
In the first place—no, it is not pure theory; for instance,
I know and I have worked so much that I have extract-

ed a very large quantity, a very large number of samples I have extracted what we have been calling all along this nitrite reacting material, which I believe now to be very nearly pure nitrous acid. Now then, on the other hand, I have made so many, many, many experiments, Mr. Elliott, wherein I have proven that when nitrogen peroxide splits up and goes into water, that nitric and nitrous acids are formed. I know the

nitric acid has gone into that flour, and having gone in there, it

is there. It is no theory.

Q. Well, I move to strike out the answer of the witness. I am asking you not about nitrous acid and nitric acid. I am asking you about nitrites and nitrates.

Mr. Butler: The witness—call the court's attention for the purpose of this objection, that the witness has defined his terms, as nitrites being equivalent to nitrous acid.

The Court: I understand the answer, but you may pursue the matter.

Q. Well, a nitrite is a combination of nitrous acid with some base, isn't it, it is all the same?

A. I see now. Now I will answer that question for you, now you have got it on a different basis again.

Q. No I said nitrite? A. Nitrite.

Q. Always said nitrite, I have not asked you anything else. The Court: Yes, you asked about nitrous acid.

A. Well, all right, I never have isolated any nitrites, now remember, nitrites, that is nitrous acid with a base; further, I testified this morning that I did not believe that existed there.

Q. All right, now then as to nitrates?

A. I told you that I had not extracted any nitrates from the flour, and I have given you my reasons for knowing that they are there.

Q. Now for the purpose of objecting to some of your testimony I ask you about this Alsop gas; I want to ask you one to two more questions on gas produced by the Alsop machine. You have seen an Alsop machine working, have you?

A. Yes, sir.

216 Q. Produce the flaming arch? A. Yes, sir.

Q. And air passes through that gas to the flour?

A. Yes.

Q. You say one of these machines is in the mill in your town? A. Oh, yes,

Q. So you could, at any time, could you not, have obtained flour, bleached or unbleached, by that process from that mill?

A. I could not now, because he has discontinued the use of the machine.

Q. At the time, you did see it I mean?
 A. Oh, I could at that time surely.

Q. Had you seen it working other places?

A. Yes, I visited the different mills in Minneapolis, and seen their bleachers working there, that is when they were using them.

- Q. You have testified in the case at Fargo, North Dakota, and in the public hearing at Washington, and in the case at London, involving this bleaching process, haven't you?
  - A. Yes, sir.

The Court: Answer audibly.

A. Yes, sir; yes, sir, I have.

Now I will ask you if you have ever taken gas from this Alsop machine and analyzed it to find what it was?

I have not.

I will ask you if you know the strength of the dilution of that gas? A. No, sir, I do not.

As in terms of air with any other substance-Oh, von do

not?

No, I do not. That depends altogether on the rapidity A. of the work and brake and insweep of the air, that can be altered.

Q. You never determined that? A. No, sir.

What is the action of the peroxide of nitrogen on protein matter as respects color?

As respects color? A.

Yes, sir. Q.

Well, that will depend something on the extent to which it is pushed; if it is pushed far enough we get what we call xantho-protein, or the yellow color reaction.

Then your answer to the question is, it turns protein

matter vellow?

A. It can if you use enough of it.

You stated to the jury did you not, that if you put those brakes on your brush it will turn it yellow?

A. Yes, sir.

Q. And what is the action of nitric acid on protein 217 matter?

A. It turns it yellow on protein matter.

- And also what other effect may nitric acid have on material with which it comes in contact?
- Well, it may-depending on its strength and dilutionwhy, it may hydrolyze starch, for instance, may change it to sugar, or if it is strong enough, it may change the starch to oxalid acid.

Q. And it may burn up things?

Yes, sir, perhaps we might put it that way. A.

Well, you testified to that, didn't you? Q.

A. Why, I will testify to it now, that it can burn up things.

I understood you to testify that when flour has been bleached, that it can not improve any further, I mean bleached artificially is that correct?

A. That is correct, unless, as I explained, there has been such a small amount of bleaching that there was not enough to effect the enzymes of the flour.

Q. What do you mean by a small amount of bleaching?

A. Well, I mean where the absorptive capacity of the flour has not been reached; you know, of course, do you not, Mr. Elliott, that the flour has a certain absorptive capacity for this gas, or for these gases, and for these acids, that it will hold a certain amount, and beyond that it wont hold; if you go to the absorptive capacity by your bleaching gas to that, and it does very often, you wont have any improvement after that, the enzymes are all dead and out of business.

Q. Now you are speaking of any particular flour, or flours

in general, some flour that you bleached?

A. I lay it down as a fundamental truth of all flours.

Q. Of all flours? A. Yes, sir.

Q. That is bleached artificially, that it can not improve?

A. Why, didn't I make-

Q. Unless, as you say, what was the clear, very lightly bleached?

A. Yes, has to be to its absorptive capacity.

Q. It might happen, might it not, that what you term "slight bleaching" is what the miller terms commercial bleaching, might it not?

218 A. That is hardly persuasive to me, I think I know

what the miller uses.

Q. Perhaps not. How, if you demonstrated, and with what flours that this bleached flour does not improve with age, or can not improve with age, or that some bleached flour can not improve with age, tell me how you demonstrate that?

A. Why, I have done it by flours that I have stored in my own laboratory, I kept them there; I have obtained, say a sample of flour, and left a portion of it unbleached, and I have worked with that flour from time to time, and I bleached a part of the same flour.

Q. Now you are speaking about flour bleached by the Alsop

process?

A. No, I am speaking about flour that I bleached myself, Mr. Elliott.

Q. Yes, Professor. Now let me ask you to confine your answer to flour bleached by the Alsop process, this electrical machine? A. Oh.

Q. Do you say that flour bleached commercially by that machine can improve with age?

Mr. Butler: Wait a moment. We object to the question, unless they define what they mean by "commercially", that is a phrase that is unknown to the court and has no meaning.

Mr. Elliott: I mean it as the witness used it.

Mr. Butler: He did not use it except in inquiries to the use of it by you.

Mr. Elliott: Well, if he acquiesced in it, what objection have you got?

Mr. Butler: What do you mean by it.

Witness: I will try it again, Mr. Elliott, let me see, what was your question, let see if I can answer it.

Q. Let me ask you another question now. Can you say from actual demonstration or proof that any flour that you have observed by the Alsop electrical machine, can not improve with age?

Now that amounts to just this, that is whether I have stored this in my laboratory, as well as my own, does it not, that is, you must admit that, I couldn't tell that without storing

it. I will answer that, no.

Q. You answer it, no. 219

A. I will answer it, no, sure I will.

I knew we would get along rapidly.

Mr. Butler: Tell me what you mean by "commercially".

Mr. Smith: You can ask that question.

Q. Now for the purpose—I believe you testified that flour bleached is less digestible than flour that is unbleached?

No. I did not testify-A.

Or bread made from flour that is bleached is less digestible than bread made from flour that is not bleached?

That is correct, Mr. Elliott. Q. You dealt with the bread?

I dealt with the bread. A.

Now you saw that flour bleached from which that bread was made? A. I bleached it in my own laboratory.

Bleached it in your laboratory? A. Yes sir. Q.

Q. You have not made, as I understand it, then, any digestion experiments with any bread that was treated with this Alsop electrical process? A. No, sir.

Now in the bleaching which you practiced for the purpose of those digestion experiments, I understood you to say that you used from 20 to 40 to 60 parts per million of peroxide of nitrogen in bleaching the flour?

A. Oh, I used a great deal less than that. I gave the range

from 4 1/2 to 180 per million.

Q. Yes, you gave it, I think—was it 4 1/2?

A. 4 1/2 to 180.

Q. But I understood you to say that in the flour you made these digestion experiments with, you used from 20 to 40 to

60 parts, may be I am wrong.

A. I will see if you are right, excuse me just a moment. (Consults memorandum). I will give you my ranges now, Mr. Elliott—from 18 parts of peroxide to 72, that was the range, on the patent flour.

Q. 18 to 72? A. Yes, sir.

### By Mr. Butler:

Q. Is that 18 parts of the nitrogen peroxide gas employed, or that amount of nitrite reacting material, do you mean?

A. No, that is nitrogen peroxide employed, the actual weight of the nitrogen peroxide employed.

## By Mr. Elliott:

Q. Now I want to get the details of this experiment, how much flour did you take and bleach in any one experiment, take one experiment, I don't care which one, take the one you used 18 parts?

A. Oh, we used the same amount of flour.

Q. Well, how much did you use?

A. Well, we usually take about half a kilogram at a time.

Q. How much is half a kilogram—I don't know if these

gentlemen—could you give us some idea what it is.

- A. Oh, a pound and a quarter, yes, for instance, it would fill your dish up to about here, (indicating), up to about here.
  - Q. That is a kilogram or half a kilogram?

A. Half a kilogram.

Q. And half of it, the half of it is up here?

- A. The half kilogram would be about there I say (indicating).
  - Q. Well, that is, take that much flour in round numbers.

# By Mr. Butler:

Q. What is that, about a quart or pint and half or what? (Witness indicates).

# By Mr. Elliott:

- Q. What does a kilogram compare to in the English system?

  A. I believe it is two pounds and a quarter isn't it?
- A. I believe it is two pounds and a quarter, isn't it?

  Q. Well, half a kilogram would be about a pint of flour?
- A. Well, it would be more than a pint, rather.

Q. A pint and a half?

- A. Yes, I used a pint and a half dilution.
   Q. A pint and half of flour? A. Yes, sir.
- Q. Now I want to know how you bleached that flour, Professor, what was your process?

A. I bleached it by the addition of pure nitrogen peroxide.

Q. And how did you do that, pour it into the vessel con-

taining the flour?

A. The flour was placed in a large vessel, one that had a capacity of Oh, eight or ten times the amount of flour that I put in, so that it wasn't anywheres near full; then by introducing the peroxide, you see a comparatively very small volume, introducing it near the flour, near the bottom, then by shaking it up, then by shaking it up then just a minute or two.

Q. Now you had, as I understand it, 18 parts per million?

A. Yes, sir.

221 Q. Of peroxide of nitrogen? A. Yes.

Q. Tell me how you got that peroxide of nitrogen es-

timated, how do you weigh it?

A. Well, that was done in this way; in the first place I generated pure nitric acid oxid, pure N. O., and then by taking the reading of the barometer and thermometer, getting both the temperature and the pressure, and by taking the specific gravity, I was able to tell exactly the weight of any volume of my nitrogen peroxide at that time, of my nitric oxid at that time.

Mr. Lyons: Speak louder, Mr. Shepard, can't hear you.

A. Yes, sir. Then this nitric oxid, as a matter of fact, was mixed with sufficient, not more than sufficient atmospheric air in my bleacher itself, so that it first went into peroxide and then as I shook it up, went into—

Q. When you say you used 18 parts per million of nitric

-of peroxide, you mean to the million parts of flour?

A. Yes.

Q. By weight?

A. 18 parts of nitrogen peroxide to-

Q. By weight?

A. By weight, to one million parts of flour by weight.

Q. Now then having bleached how long did you expose it, how long did you keep it in there?

A. Oh, shaking it up and down?

Q. Yes, sir.

A. Oh, about three, from three to four minutes.

Q. Did all the peroxide disappear?

A. Yes, the peroxide disappeared, that is the color left the flask.

Q. And what was the color of the resultant flour?

A. Did you want the color table?

Q. I would not understand it, just in terms of white?

A. Oh, it whitened it.

Q. It was white, was it? A. It whitened it.

Q. Whiter than it was before?A. Whiter than it was before.

Q. Then I suppose you baked that into bread, that flour?

A. Oh, it was removed then from the bleacher and stored and finally baked into bread, yes sir.

Q. How much bread did that make, approximately, one loaf?

A. Oh, I didn't use it all. We only take about 300 grams, Oh, it takes about 300 grams to make a loaf of bread, about a pound loaf, and we have certain rules that we follow, so that left me 200 other grams for other purposes.

Q. Well, before you baked it into bread, did you test the

flour for nitrites? A. Yes, sir. Q. How much did it contain?

A. I testified to that, Mr. Elliott. It is on record. Now do you want to confine your question to any specific amount, Mr. Elliott; do you wish to confine your question to any specific

amount—18 parts?
Q. The flour you bleached with the 18 parts?

A. All right, sir. Where I used 18 parts of peroxide per million, I was able to find in the flour 1.98 parts per millions.

Q. Is that nitrogen nitrites?

A. That is nitrogen peroxide; I don't use that expression nitrogen as nitrites, it is all nitrogen peroxide, everything.

Q Just tell me put it in terms of nitrite nitrogen, would

you figure it higher or lower than you have?

A. Oh, it would be very much lower, about four times lower, that is, if I should call that all nitrite nitrogen, which [—] is not by any manner of means, but if we call it an equivalent to it, I would have to divide my 18 by 4.

# By Mr. Butler:

Q. Divide the 1.98 by 4?

A. I would have to do better than that, because now, see here, Mr. Elliott, when this peroxide goes into water, half of your nitrogen runs right through, and the next change, half is lost again, so we have only ¼ of this, and put in that ¼, so that if I should take ¼ of 18, that would give me about four, and then if I should better it by the relative amount of nitrogen as compared with nitrogen peroxide, I better it by four; that would make me about one part again of nitrite nitrogen per million that I actually put in, that is the truth.

Mr. Butler: How much taken out?

Q. I am asking for what you found in the flour, not what you put in; what did you find in the flour?

A. You could divide the figures there about by 16.

Q. By 16? A. Yes, sir.

By Mr. Butler:

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Q. That is 1.98, divided by 16.

A. Yes, that is what it would be; that would go one and in thirty-eight—about 12/100 of nitrite of nitrogen, that I actually found in that flour, and then I found in the bread about two parts of nitrite nitrogen, if you want to figure it.

Q. You took a certain proportion of this flour and made

bread from it, did you? A. Yes, sir.

Q. And you took a like proportion of the unbleached flour and made bread from it, I assume? A. Yes, sir.

Q. Now tell us how you performed that digestion experi-

ment, first give us one of them, using this 18 parts?

A. Well, I run them altogether, for instance, these that I have gotten here, that I brought you, I ran them altogether, I ran them in the series.

Q. What artificial digesting substance did you use I mean?

A. I used a solution of pepsin, the active principle of gastric juice, with 2/10 per cent hydrochloric acid solution, that is a very close approximation to the digestive juice of the stomach, and I placed a large quantity of that in a beaker, I had a large beaker, one that would hold about two or three liters, and these weighed quantities of bread.

O. Now first tell us how much digestive fluid you had?

A. Oh, I had worlds of that.

Q. How much?

A. Worlds of it, more than I needed, probably a couple of liters.

Q. Well, I mean I want a definite experiment with figures now, we have got thus far, and you say you made a digestive solution, and you put these tubes containing the bread in it; I want you to describe it.

A. I tell you, Mr. Elliott, I believe you better let me tell you, how I made that experiment, because I can see from the way that you start to asking questions that you don't know

what I did nor you don't know how I made it.

224 Q. I don't, I want you to tell me?

A. All right, I will tell you then, and I will tell you in full. First, I had a large beaker that will hold three or four times as much as this one.

Q. That will be about a gallon? A. Oh no.

Q. Oh, no, half a gallon?

A. Yes, about a couple of quarts; then I filled it like this, we'll say, with the digestive fluid, but it doesn't matter how

much, with this fluid: I might have an opinion of it, if I wanted to, but that does not make any difference, you know. Then I took tubes about the size of this, that is about that round, about, well-3/4 of an inch in diameter, and 8 inches long, and I cut the bottoms off the tubes. I tied a fine muslin strainer right over the bottom of the tubes, I grouped those tubes and I put a certain series of these tubes, ten or a dozen of them, these were all run in duplicate, and the figures that I have given here are means, in one single trial, you know, and then you can imagine to yourself a group of these two, bound around with elastic bands, so that they were all the same, the same amount of bread from each sample, of course, was put in, like that. Then this was set right down like this, until the digestive fluid rose two or three inches above the sample of bread that was in there. Now it was kept about 40 degrees centigrade; that is about the temperature of the stomach where the best digestion occurs, and it was left there until the digestion had gone on its way a long time. Now you see what happened. The bread was right down here on your little muslin strainer. As the digestive juices attacked it the solution became heavier; and that heavier solution just filtered and dropped right down into the large vessel out side; so it kept in contact with a fresh amount of solution all the while; and then when the digestion-I did not allow it to go to completion, mind you, if I had, I would not have had anything to inform my self, because my bread would have digested completely—so I had to stop before that was completely digested. Well, as soon as it was completely digested I could just take this all up at one time, so that every one got the same treatment absolutely, the same all the

225 way through, and then by setting this down once or twice in cold water, fresh water, why, we washed the digestive solution all off from them, so that there was nothing left but the undigested residue. Then we found—that is, I determined the nitrogen, although, I presume you would not be interested in that

Q. Yes, I am very much interested in that? A. Are you?

Q. Yes, sir.

A. You want me to tell you how I got the nitrogen?

Q. No, just tell me how you determined the rate of digestion.

A. Oh yes, I see. Now then it is evident, that if our peroxide is making any difference with that bread with our one sample that didn't have any in, it ought to go a little faster than the other.

Q. Ought to digest faster?

A. Ought to digest faster, and there ought to be less left in that set of tubes.

By the Court:

Q. Less residue?

A. Less residue, yes sir, less residue, and where the others have been affected, there would be residue left according to the amount of disturbance that was brought about by your peroxide. Now then having determined beforehand exactly how much protein I put into each tube, I then analyzed those residues once more, and determined how much protein I had left, and that gave me exact data for comparison.

Q. In other words, you determined the nitrogen compounds

of the residue is that it?

A. Yes, and that is the way I determined it.

At this point the further hearing of this cause was adjourned until tomorrow, Friday, June 3, 1910, at 10 o'clock a. m.

226 Kansas City, Missouri, Friday, June 3, 1910.

Court met pursuant to adjournment, and the further hearing of this cause was resumed as follows, to-wit:

# Morning Session.

James H. Shepard, in continuation of his Cross-examination further testified as follows:

By Mr. Elliott:

Q. Professor Shepard, I will ask you what you would set as the limit of experimental error in making nitrogen determinations of flour?

A. We consider a determination satisfactory when we get a variation of about one to two-hundredths of one per cent.

- Q. Now will you tell me, if using one gram of flour, I think that is what you used, wasn't it, one, in the digestion work—how much was it you used?
  - A. We usually use one gram, O. Is it one gram? A. Yes.
- Q. And assuming the flour contained as a result of bleaching two parts per million of nitrite nitrogen, I will ask you if you could possibly determine any loss of what you have referred to as albuminoid nitrogen, and again of amid-nitrogen?
- A. Now, just repeat the first part—could I determine—Q. In other words, would not all of your figures be within the limits of experimental error? A. Clearly so.

Q. I have not your exact figures in mind, but I will ask you if it is not true that the figures you gave yesterday were not within the limits of experimental error?

A. They are within the limits of experimental error.

Q. Now, Professor, I will ask you if nitrous acid is a volatile gas?

A. We are only acquainted with nitrous acid in liquid dilute form, that is, I mean in water solutions, the probabilities are it is a gaseous compound and volatile.

Q. Well, let me ask you, do you say there is such a

thing as nitrous acid gas? A. Yes.

Q. And isn't it the fact that it is so volatile you can not possibly isolate it? A. Yes, sir, that is true.

Q. Now, that would mean that it readily volatilizes at ordinary room temperature, doesn't it? A. Yes, sir, it does.

Q. Wouldn't it be reasonable then, that it would volatilize

in a bake oven?

A. Yes, sir, it is constantly going outside of the bake oven or into a gas.

Q. Now I will ask you if you have any experience with baking bread made from bleached flour? A. Yes, sir.

Q. To determine if the bread had any nitrites?

A. I have.

Q. Have you made any experiments by making the dough of bread and making nitrite determinations on the dough to see if the yeast plant had destroyed the nitrites?

A. No, I have not made those experiments.

Q. What would be your opinion?

A. My opinion is from results that I have obtained on the bread, that under certain circumstances that the yeast consumes the nitrite material or the nitrous acid, probably, after it has first passed into a nitrate.

Q. Now isn't it true that not all of the gas that goes into this agitator, gets into the flour. You testified, you could

smell it I believe, in the mill. A. Yes,

Q. That escapes from the agitator, does it not.

A. That had escaped from the agitator.

- Q. I want to ask you one other question in reference to your digestibility experiments. Did you not in one case show that the bleached flour digested more readily than the unbleached flour. A. I did.
- Q. I think you said something as to bleached flour damaging the looks of it, I mean, I just have a note—did you make such a statement as that, do you recall?

A. I do not recall making that statement.

Q. Well, I won't ask you about that. I will ask you, professor, if it is not true, that a straight flour can be made to resemble a patent flour without bleaching and irrespective of bleaching by the ordinary processes of milling? A. I don't think so.

Q. Are you prepared to dispute that proposition if I say it

can?

A. I should just simply probably say that it could not, and let it go at that.

Q. Well, I mean, is your knowledge of the milling art sufficient to justify you in disputing the proposition that a straight flour by the ordinary milling processes can be made to resemble a patent flour?

A. Well, I say this, that I never have seen a straight flour

that resembled a patent flour.

Q. Very good, but that is not the question. My proposition is that irrespective of bleaching, the straight flour by ordinary milling processes can be given a color the same or even superior, I will put it, to patent flour. Now are you prepared to dispute that?

A. Not as a general rule can it be done. It is possible, though that some such highly refined methods as Mr. Smith was telling us of, that the resemblance might be made very

close, but the ordinary mill can't do it, Mr. Elliott.

Q. You say it cannot be done?

A. Not an ordinary mill working the way the ordinary mills do.

Q. I believe you testified that all grades of flour can be bleached and brought to one uniform color, did you not?

A. I believe that that is very nearly a correct statement; I don't remember, I do not recall just exactly under what circumstances.

Q. Well, I will ask you is that your judgment?

A. With all grades, no. I would not say that; the red dog, for instance, could not be brought to resemble the other grades.

Q. Well, cut out the red dog?

A. Yes, take for instance, a clear-

Q. You don't understand red dog to be flour, do you, as we ordinarily use the term?

A. Well, it is one grade of flour.

Q. All right, we'll cut that out now.

A. Yes, A clear, properly made, can be bleached so that it will resemble a patent, Mr. Elliott.

229 O. No, that was not the question, can they all be—can the bleaching bring them all to a uniform color?

A. Yes, take the straight, the patent and the clear they can.
Q. And if you bleach them all alike, they will all be brought to uniform color?

A. I don't say that, Mr. Elliott.

Q. Well, if you bleach them any way you like, they all can be brought to uniform color?

A. If you bleach them properly, that is, if you bleach them with that object in view, you can bring them to the same color.

Q. And you say that, take any flour, from any wheat, as

many grades as you like, that after bleaching them, will not all possess, there will not be the same relative difference between those grades after bleaching as there was before bleaching?

A. Yes with that particular variety of wheat, that is true.

Q. There will be the same relative difference, or do you mean they will all be the same uniform color?

A. I mean they can all be made to resemble one another.

Q. Well, let me put this question to you. Suppose they are all bleached in the same way, will [they] be the same relative difference between those grades after bleaching as there was before bleaching?

A. Do you mean by the same way, Mr. Elliott?

Q. Well, bleach your flour the same as you bleach the patent flour?

A. You mean the same amount of bleaching?

Q. Just run it through the machine the same as you did the other?

A. I think there might be some slight difference then.

Q. That is, there might be the same relative difference between the grades after the bleaching as there was before the bleaching?

A. No, provided—there would not be that relative difference, provided the amount of bleaching re-agent was sufficient to satisfy the absorptive power of the flour, then they would all be alike.

Q. Professor, if you will just pay attention to the way I put my question. It involves this proposition, that they were all run through the—given the bleaching process in the same way run through the machines the same length of time and all conditions being equal?

A. I understood your question, Mr. Elliott, but you have not told me now how much of the bleaching re-agent would

230 apply.

Q. It doesn't make any difference, professor, my question is, take any amount you please. Well, I will put it this way, take a mill that is bleaching its flour in the ordinary way, that is bleaching it, and it bleaches all the grades it makes, including the low grade red dog. Now I ask you—and they are all treated in the same machine in the same way,—will there be the same relative difference after the bleaching as there was before the bleaching, as to those grades?

A. I will answer you as carefully as I can. If the natural run of the mill furnishes enough to satisfy the absorption of the flour barring say red dog, they might be brought—there will not be but relative difference. If, on the other hand, only a very slight quantity of the bleaching re-agent employed there

will still be difference, Mr. Elliott.

Q. I object to the witness's answer as not responsive, and move it be stricken out. My question did not say anything about the absorptive—whether there was enough gas for the flour to absorb or anything about it.

A. That is what I was objecting to, Mr. Elliott, you don't

give me a rational base,

Q. I am giving you all that I possess, Prof. Shepard; I am taking an ordinary mill, some mill, in this city, we'll say that is bleaching its flour, go there at any time of the day or any time and any day of the week, and go into that mill and let it bleach all the grades of flour that it is making, excluding this low grade, I ask you after that bleaching—now mind you, it does not change the bleaching in any way, after that bleaching, will the different grades, will there be the same relative difference between those grades as there was before the bleaching, or do you know that?

A. I will answer your question.

O. Well, what is your answer?

- A. My answer is this, running as they do ordinarily do, the differences will not exist after bleaching.
- Q. All right, now I will ask you if you have ever tried to bleach flour with nitrous acid gas or nitrous acid will do, 231 bleaching flour?

A. I never have tried pure nitrous acid.

Q. Do you know if nitrous acid will bleach flour?
A. You mean nitrous acid, not the peroxide, of course?

Q. No, the nitrous acid?

- A. Nitrous acid-I think it is conceeded that it will.
- Q. That the nitrous acid— A. Yes. Q. Will bleach flour? A. Yes, sir.

Q. Will nitric acid bleach flour?

A. I think it will, yes, sir.

Q. Prof. Shepard, if I put nitric acid on flour, the chances, isn't it almost certain it would burn it up?

A. What strength acid would you pour on?

Q. Take pure nitric acid.

A. Why, I think, why, I know that it would not burn it up,

Mr. Elliott, but it would destroy it as flour.

Q. Well, take commercial nitric acid, 36 per cent, isn't it, something of that kind, you say pour that on flour to make it white?

- A. No, I don't say anything of the kind.
- Q. Well, I said nitric acid? A. Yes.
- Q. Now those are the only two nitric acids as such that there are  $\widetilde{?}$

A. Yes, but you know enough of chemistry, Mr. Elliott, to know that what that acid will do to that flour depends on the dilution of that acid.

Q. No, excuse me, you must not put that on me, I don't know any such thing? A. Well. I do.

Q. Well, all right. Did you ever see nitric acid as bleach for flour?

A. No, I never have tried it, but I have tried the two together, and they do it fine.

Q. Then you get peroxide of nitrogen don't you?

A. What say?

Q. You had peroxide of nitrogen?

A. Yes, sir, to start with.

Q. Now I will ask you Prof. Shepard, if heretofore you have not given testimony in a case in which you deal with the fact that nitrous acid would inhibit digestion as applied to flour?

A. Yes, sir.

Q. And I will ask you if you did not publish the re-232 sults of your experiments in a paper?

A. Yes, sir.

Q. I want to hand you a copy of the Food Law Bulletin, dated Chicago, August 12, 1908, which I will ask the stenographer to mark as Claimant's Exhibit 201. Calling your attention to that exhibit, will you kindly say do you recognize that as your article?

A. Yes, sir, I recognize it.

Q. And I will ask you further if you can state that is not the article which by common consent we used as the basis of your cross-examination in Fargo, at the trial referred to?

A. Yes, sir, that is the one.

Q. And I will ask you further if with the exception of one or two typographical errors, you did not state that this correctly reported your investigations, if you remember?

Mr. Butler: Just a moment, I don't know what the purpose of this is, whether it is to offer it in evidence or not. If so, the line of inquiry is immaterial.

Mr. Smith: Suppose, Your Honor, it is laying the foundation for subsequent proof.

Mr. Butler: Is it offered in evidence?

Mr. Smith: Have a little patience, I don't think it shows anything improper.

Mr. Butler: I object to the cross-examination concerning what is in a writing not offered in evidence, and when counsel expressly declines to say whether or not he will offer it in evidence,

The Court: Mr. Elliott, you ought to say yes or no to that.

Mr. Elliott: I have not asked the witness a thing about the contents of this. I am not going to ask him.

The Court: Well, go on a little bit, no use examining him about some paper unless it is to go in evidence.

Mr. Elliott: I am not going to examine him about it.

(Question read by the reporter.)

The Court: He may answer that, we will see what becomes of it now.

A. I answer that, yes.

Q. Now I want to ask you if in that case in Fargo, in 233 which you testified, if it is not within your knowledge that the court made one of which I am going to read to you, as a finding of fact?

Mr. Butler: Just wait a moment before it is read-the question so far stated is this, is it not within your knowledge that the court at Fargo, made a finding of fact which is as follows:

The Court: I understand, Mr. Butler.

Mr. Butler: Now I am not unwilling at the proper time and place to try the Fargo case, which was a suit in equity, as it is reported, and your Honor knows all about it.

The Court: I know the Dakota case.

Mr. Butler: But he has just offered to talk about findings of fact there, and we object to the statement of any claimed substance of any finding under the form of asking a question.

The Court: Objection sustained.

To which ruling claimant then and there duly excepted.

Mr. Elliott: I would like to note an exception to that ruling.

Q. Now I will ask you, Prof. Shepard, if you did not testify that bleaching impairs or destroys or something of that kind, the odor of flour? A. I did.

Q. And would you be able to tell by the sense of smell

that the flour has been bleached?

When it has been freshly bleached I could but after a sufficient time had elapsed I could not.

Q. What do you mean by sufficient time?

Oh, anywhere from two days to a week, depending on how the flour was stored.

Q. And you could not, after that time you could not tell whether it has been bleached or not, by the sense of smell?

A. No. sir.

Q. I hand you a package of flour marked "Defendant's Exhibit 202" and ask you to smell of the flour therein, and state if you can tell by the sense of smell if it has been bleached or not?

Mr. Butler: We will object to the experiment, test. If we begin that we will begin to enter upon a field it seems to me that it will never end.

The Court: I tell you, Mr. Butler, I have been thinking a little, but not consecutively about this matter of experiments. I assume that at some convenient time to counsel they will cite authorities or an argument will be made upon that question. Without reference to whether this will be a precedent or not, I see no objection to a very limited number of these, but before I go into this experimental field everything, cooking bread, and a whole lot of these things, I will want to be further advised than I am now to enable me to pass on this question.

Witness: I will state, Mr. Elliott, that I have such a cold this morning that I am physically incapacitated, could not, I am in no condition to make a test, but I tell you what I will do, I can do no better, I show my good will even if I felt—

Q. That is fair. A. I can't tell you.

By Mr. Smith:

Q. What you say? A. I can't tell.

The Court: I will say that Mr. Elliott, so there may be nothing regarded at all decisive or a precedent, before either side enters into any experiments I would like to be advised by counsel for both sides—I suppose we do not stop now, and some time or other we must stop and consider it.

Mr. Elliott: I understand your Honor to mean, that before we introduce any experiments, or make any, you wish us to consult you and with other counsel?

The Court: Both sides. I have no preconceived notions about it, unless it might be I could say that both sides would be swamped if we are going to do a lot of cooking school or chemical laboratory, take a bite of bread out of every con-

ceivable kind of flour, I don't know what kind of a fix
we will be in when we get through, I don't know about
these things, I don't know to what extent you are going
into it.

Mr. Elliott: That is all as far as this is concerned.

The Court: I am neither for you or against you, Mr. Smith, I don't know about that.

Mr. Butler: I understand the rule to be that the witness may not be required to enter upon physical tests.

(At this point the jury was excused, and a lengthy argument and colloquy was had between counsel and the court as to permitting the witness to make certain tests and experiments in the presence of the court and jury.)

Whereupon the jury returned to the jury box, and the examination proceeded as follows:

The Court: I have no objection to these few exhibits, I am not sustaining the objection to Mr. Elliott's first question.

Mr. Smith: Go right ahead with it.

The Court: But of course, you understand what we have been at here.

The objection to this particular exhibit 202 will be overruled. He has already answered it.

Mr. Smith: Yes, let it go at that.

The Court: And with the right to recall the witness, perhaps.

Mr. Smith: Yes.

The Court: Or rather, I assume that these witnesses want to get away as soon as they can; I don't know anything about this gentleman. I will decide this question definitely by tomorrow morning and reach a conclusion by which I will stand.

Mr. Elliott: I will finish the cross-examination.

Q. There was just one question I neglected to ask. You state, I believe that you detected a change in one of the color compounds by bleaching it was the yellow I think?

A. In both of them, Mr. Elliott.
Q. Sir? A. In both of them, sir.
Q. Well, didn't one disappear there?
A. The orange disappears there, yes.

Q. I just want to ask you if you made any examination of natural wheat flour to see what happens to the coloring matter? A. No, I have not.

Q. That is all.

The Court: Any re-examination, Mr. Butler?

Mr. Butler: I think perhaps a question or two.

### **Redirect Examination**

By Mr. Butler:

Q. During the cross-examination of Mr. Elliott, as I recall it, you were asked in substance whether in the examination of bleached flour you had ever isolated nitrous acid, and you said you had not, and I believe that the acid itself had never been isolated. Will you describe to the court and jury how there may be, if it is a fact, a complete demonstration of the existence of nitrous acid or nitrite reacting material or nitrites without solution, in the sense that we would take a pin from a sack of wheat?

Mr. Elliott: I object to the question so far as it relates to nitrites, because the witness has specifically stated first, he did not get them, and second, he did not believe they were there.

The Court: You may answer.

To which ruling of the court claimant then and there duly excepted.

A. Well, take for instance, a certain quantity of the flour depending upon how much of these materials are present,—these are placed in a flask similar to this one right here; the

flour is placed in the bottom, and a certain quantity of pure distilled water is turned on, and you shake it up, agitate it like that, keep shaking it up, allowing the

water to cover every particle of flour. After it has stood a few moments, the water then can be turned off, and run through a filter paper, and you will get a perfectly clear solution. Now, the nitrous acid, or nitrites, which I have said I do not believe exist there, comes in that water solution. Now a nitrite or a nitrous acid that will give exactly the same base, so we can apply it, we take a re-agent, called the Griess re-agent, and turn in there, it is made of some chemicals with great long names, and immediately a pinkish color begins to develop, providing the nitrous acid is there; we can demonstrate in that way absolutely that this material is there, but as for isolating it, why, that can not be done, nobody can do that.

Q. Is the method described by you just now to the jury well known and recognized by chemists?

A. Every chemist uses it.

Q. Mr. Elliott called your attention to the fact that chemical combinations of poisonous elements are not necessarily poison, that is to say as I would apply the general statement. Assuming an acid which is poisonous, combining with a base, making a salt, it does not necessarily follow that the salt is either poisonous or non-poisonous, does it? A. That is true.

Q. And each particular combination must be viewed by itself? A. Oh, it is no basis.

Q. Now as respects the atmosphere, suppose it be decomposed, and the oxygen taken out, what would be the effect of attempting to leave in the remnant?

A. Nothing but pure nitrogen would remain, and we would die in less than—well, we would not last two minutes; we

would die of oxygen starvation.

Q. Now you were also asked whether you ever found nitric acid in the flour, and I think you were also asked if you never did find it, how do you know that it was formed in the flour by treating it with this nitrogen peroxide gas. You may explain that to the jury.

238 Mr. Elliott: I object to that, your Honor, as mere repetition. The witness was given full opportunity and he has given his testimony on that point. I don't think it is proper redirect examination.

The Court: Now you may or may not be right. Mr. Butler may or may not be right, but I do not recall therefore will not make a ruling which would require me to say that you are right, and he is wrong, or you are right and he is wrong, so he may answer, of course, subject to further examination by you.

To which ruling of the court claimant then and there duly excepted.

A. We know that the nitric acid is there, because it is one of the well established principles of chemistry that when nitrogen peroxide comes in contact with water, which nobody denies or disputes that it does, that both nitrites and nitric acids are present, they are formed, now then it doesn't matter where you take these nitrites or this peroxide, you allow it to come in contact with water, which it certainly does when it comes in contact with the flour, and both acids are formed, there is no possible or imaginary way in which nitric acid could escape being in the flour. The principal thing with me, however, is that I had not made a test for that nitric acid, there are plenty of chemists have done it.

By the Court:

Q. You have or have not?

A. I have not, because it was unimportant, and besides the question, we was working after some other things—after the nuclei.

Q. Something was said to you about color resulting from bleaching the flour, and the phrase "chalky white" was used, if the question was answered, I can not remember with certainty, how does that color compare with the color attained in good wheat flour of high grade by the process of natural aging, or are we to understand the colors are identical?

A. Not at all.

Q. Or similar or different?

239 Counsel for claimant objects to the question as leading, suggestive and not proper redirect examination, having all been covered by him in his direct testimony.

Mr. Butler: It may be, Mr. Smith.

The Court: You will all be given the further right. Go ahead.

A. The flour that is naturally aged, is whiter, but it is a creamy white, we describe it as a creamy white; while flour that has been bleached to this chalky whiteness is a more dead white or an ashy white.

Q. In Government's Exhibit 2, which is in evidence, I find this statement, among the specifications: "I have found that flour after being acted upon by the modified air, that is air

which has been"-

Mr. Elliott: Just one moment. I object your Honor to the reading of this statement into the record from this patent, for the reason that claimant in this case is not bound by any statement that Mr. Alsop makes in any patent as to any effects on flour, or what not. He may be right to get the report, but I don't think it could possibly have any bearing upon the claimant's position in this case.

The Court: Objection overruled.

To which ruling of the court claimant then and there duly excepted.

Q. I will restate the question—I had not finished the question, Mr. Elliott, and your objection was to my finishing it, if that be so then I may go on, I had forgotten for a moment.

The Court: You are now reading from the statement of the patent.

Mr. Butler: In evidence, yes, sir.

Q. Which is as follows: "I have found that flour after being acted upon by the modified air, that is air which has been acted upon by the spark, your matter is very notably bleached,

presenting a dead white color, in contrast with the creamy yellow of the untreated flour." Now in your description of chalky white, is there any distinction to be made between that and the dead white color referred to here?

A. I make no distinction.

By the Court:

Q. Sir?

A. I make no distinction, I mean the same thing if I say

dead white or chalky white.

Q. One of your answers in cross-examination related to the effect upon the proteins contained in the flour by this bleaching process, and your answer was as I caught it and hold it in my hand from my note, that if pushed far enough, it will turn protein matter yellow. I have your answer down. Make it clear what you refer to as being pushed far enough. I would like to have you, if you so testified, explain that to the jury, and how it happens? A. Simply this-

Mr. Elliott: Just one moment. I would like to interpose an objection to the question as incorrectly detailing the testimony of the witness.

Mr. Butler: In what respect, Mr. Elliott?

Mr. Elliott: I have no recollection of his testifying to any such thing.

Mr. Butler: Yes, he did.

Mr. Elliott: My recollection is that I asked him the effect of peroxide of nitrogen on protein matter, and he said it was to turn it yellow. Now you may be wrong, I may be wrong, I simply-

Mr. Butler: I don't see the difference between us yet.

The Court: Well, go on, professor.

A. I meant by the expression pushing it far enough, that is to employ enough of the re-agent to do it. Now the gentlemen of the jury must always bear this in mind when we chemists are talking, that we make great distinctions between a diluting agent will do one thing, and that some one made strong enough, will do altogether something else; that is what I mean, I mean it must be strong enough to-

Q. In this morning's cross-examination touching the bread experiment tests, you were asked whether yeast .241

was employed, and whether or not so testified concerning the point, whether or not yeast consumes nitrites, and your answer was, [I] as I understood you, that it did, after they had changed some way-I don't know?

A. In the nitrites?

Now make that clear, if there be a distinction between the consumption of nitrites directly, and the consumption of nitrites after the chemical alteration?

A. I hold, and a very large number of chemists hold, with me, that nitrites directly are consumed as a food by neither

plants nor animals, but these nitrites by taking up one more item of oxygen can pass into nitrates which are admittedly a plant food.

Q. Have you in mind any familiar example of that in ordinary life, plant life? A. Yes.

Q. Agricultural pursuits?

A. Yes, sir, I have, for instance, take sodium nitrate, Chili saltpeter; it is mined over on the coast of Chili, and it is shipped all over the world and used by all farmers as a fertilizer, but nobody ever does on the nitrite, and there are species of bacteria in the soil and in the air, and in the water, and even in the air, Mr. Butler, that can take nitrites that are formed in the soil, and change them into mild and useful nitrates and plants consume those nitrates.

Q. I think that will be all.

The Court: Anything further, Mr. Elliott?

Mr. Elliott: No.

Overton W. Tucker, called as a witness on the part of 242 the Government, being duly sworn, testified as follows:

## Direct Examination

By Mr. Butler:

Q. You are a miller by trade? A. Yes, sir.

Q. And you are employed by the defendant, the Wellington Mill and Elevator Company at Wellington?

Lexington Mill & Elevator Company at Lexington. A.

Nebraska? A. Yes, sir. Q.

The Court: Now, Mr. Tucker, talk as you talk out on the Nebraska prairies so we can hear you.

A. Yes, sir.

Did you mill the flour that was seized in this case?

Yes, sir, I set the mill for the flour that was seized in this case.

By the Court:

Q. What? A. I set the mill.

What do you mean by setting the mill?

Well, I started the mill and the principal part of the flour was made at night, but I started the mill and set the mill right.

Talk to the jury? A. Right to make the flour. Q.

You are the boss miller there? A. Yes, sir. In charge of that mill? A. Yes, sir. Q.

And it was run night and day?

Yes, sir, had been running night and day, but had not

been running that day owing to some repairs that I had been making, and I did not get started until evening.

Q. What percentage of the total flour contents of the wheat

was included in the sacks seized? A. Ninety per cent.

Q. Ninety per cent?

The Court: I didn't understand, you say what?

Q. What percentage of the total flour contents put into those sacks were marked patent; he says ninety per cent.

A. Approximately 90 per cent.

Q. Was there any wheat known as yellow berry or yellow belly included in the wheat that made this flour?

A. It is possible that there was.

Q. How much? A. I can't tell you.

Q. Give us your best—it was mixed yellow belly with some thing else, was it not?

A. Practically all the wheat in Nebraska is.

Mr. Butler: We move to strike out his answer as not responsive.

The Court: Yes, that is stricken out.

(Question read by the reporter.)

A. Yes.

Q. What percentage of it was yellow berry or yellow belly?

A. I can not answer the question.

Q. About what percentage?

A. It would be an estimate, if I answered it.

Q. Give us your estimate?

A. Oh ten to thirty per cent.

Q. Are you willing to say that it was not as much as—say positively that it was not as much as thirty-five per cent yellow berry or yellow belly?

Counsel for claimant objected to the question as leading, suggestive, and attempting to cross-examine his own witness, incompetent and immaterial.

The Court: Well, for reasons which you will indulge me not to state, I think you may ask leading questions.

Q. Go ahead. Have you the question in mind exactly, Mr. Tucker? A. No.

By the Court:

Q. How?

A. No, I would not say positively that it was not—

Q. Will you say positively that it was not as much as 40 per cent yellow belly or yellow berry? A. No, I wont.

Q. Will you say positively that it was not as much as 50 per cent yellow berry or yellow belly?

Same objection by claimant as to this.

Q. Half yellow belly and half something else?

Same objection by claimant, as incompetent, irrelevant, immaterial, cross-examination of his own witness, no proper foundation laid and wholly unfair.

The Court: Leading questions, are permissible, what the reasons are is not best for me to state, but why unfair?

Mr. Smith: Simply because the witness has said he don't know, he can't state exactly, and therefore it is entirely unfair to say to him "Now can you say positively"? The witness has said he couldn't tell.

The Court: He can give an estimate, I think he might answer.

Q. What do you say as to 50 per cent?

A. No, I could not answer that.

Q. Well, what per cent [co] you get to, I suppose what you are driving at—

Q. Well, if the court will allow me to state-

The Court: Yes.

A. One certain fact, I think I can enlighten him on that.

The Court: Turn to the jury please.

A. That I don't know, no other living man knows where a yellow berry wheat begins or ends.

Mr. Butler: I move to strike out his affirmation about what other people know.

Mr. Elliott: I object to striking it out.

The Court: Well, the answer will stand.

Mr. Butler: That part of the answer what he thinks other people don't know.

The Court: Well.

By Mr. Butler:

Q. Do you know how many Alsop bleachers you had in the mill when this flour was milled, with certainty?

A. Yes, sir.

Q. How many? A. One.

Q. How many generators were there? A. One.

- Q. How many were in operation? A. One.
- Q. Was there any that was not in operation?
- Q. Do you swear that there were not two apparatus there, either in operation or not in operation?

A. There were two apparatus there but it was not generators.

Q. Two bleaching apparatus? A. Yes, sir.
Q. Alsop bleaching apparatus? A. Yes, sir.
Q. Each apparatus has a generator, hasn't it?

The Court: Let's get along.

A. No. sir.

Q. There can be an Alsop bleaching apparatus without a generator? A. Yes, sir.

Q. No generator at all?

A. You can operate two electrifiers from one generator.

Q. What do you mean by an electrifier—agitator you mean?

A. No, I mean an electrifier.

Q. How many arrangements were there for making flaming arcs in that mill? A. Two.

Judge Scarritt: Let's understand what he calls a generator.

Mr. Butler: That is what I intended, he described is as a generator.

A. The generator is what I described as the machine that manufactures the electricity.

Q. That is in the place where the flaming arc is, isn't it?

A. No, sir, not the way I understood. Q. Oh, you mean dynamo? A. Yes, sir.

Q. Oh, yes, so then you say there was only one apparatus there, because there was only one dynamo?

A. I didn't say there was only one apparatus there; I said there was one Alsop bleacher.

Q. You don't consider a dynamo- A. A dynamo.

Q. Well, there was one dynamo and two places to make the gas for bleaching? A. Yes.

Q. That is what I mean, only one dynamo, and two places

to make the gas? A. Yes, sir.

Q. What floor were those two bleachers?

A. Second floor.

Q. What amperage was employed on the one in operation, you say there was only one operating on this floor or two, I mean now bleachers?

A. I think that both of the electrifiers were in opera-

Q. That is what I mean? A. Yes, sir.

Q. But one dynamo made electricity enough for both?

A. Yes, sir.

Q. And you say two bleaching machines upon this floor, two machines generating what you call electrifiers, generating this gas? A. Yes, sir.

Q. You had two of them?

A. Yes, sir, I had two of them working generating gas. Q. What voltage to each? A. I could not state.

Q. Or amperage to each?

A. About three to three and a half.

Q. To each one? A. No, to both of them.

Q. To both of them. A. Yes, sir.

Q. Divided equally between them or—
 A. Well, practically equally, both worked on one end.

Q. Well, can't you tell right at a glance what the amperage was, isn't that part of the business to set that just the same as it is to set your streams?

A. You can not set it definitely.

Q. Why?

A. Because the making and breaking of the contact swings the hand of your meter, you can not get it to a positive point.

Q. Can't you control the volume of the current used?

A. Yes, sir.

Q. Well, what volume did you use there to bleach this flour?

A. I used three to three and a half.
Q. What voltage?

A. I don't know definitely what the voltage was.

Q. Well, about what? A. Oh, possibly 450 volts.

By Judge Scarritt:

Q. On both of them? A. Yes, sir.

By Mr. Butler:

Q. Were both these generators of gas, not of electricity but

of gas, upon the same floor? A. Yes, sir.

Q. And were they at the same part of the mill that the agitator is which the flour is agitated to work the gas in with it? A. They were on the same floor some distance apart.

Q. But the agitators of these two gas generators were on the same floor? A. Yes.

Q. What floor? A. Second floor.

Q. Second floor, how far from the generator was each one from the agitator was each one, how far did the gas have to go? A. About thirty feet.

Q. Have any storage tanks on the way in either case.

A. Yes, sir.

2. How many. A. One.

Q. On each one? A. No, sir.

Q. You had one pumping it direct and the other one through a tank? A. No, sir.

Q. Well, how? A. Both machines pumped into the tank.

Q. Both machines pumped into the same tank?

A. Yes, sir.

Q. And that tank was connected directly with the agitator?

A. Yes, sir.

Q. Are you familiar with the patent for these tanks that was gotten out by John E. Mitchell and a man named Parks—Mitchell who testified yesterday, and a man named Parks, the patentees of these tanks?

[Q.] Well, I don't know as I clearly understand what pat-

ent von mean.

Mr. Smith: You mean the patent or the tank?

Mr. Butler: I want to find out whether the same kind of tank Mr. Mitchell patented or if they are different ones.

Q. (Handing to witness Plaintiff's "Exhibit 7") The paper which is marked Government's exhibit 7, containing a cut purporting to be a system of three tanks, under the caption: J. E. Mitchell, Method of treating flour. Application filed September 24, 1904. Now in that picture you see there is a series of three tanks? A. Yes, sir.

Q. So arranged that the gas passed from one, it shows the gas generator, goes into one, and then into another, and then another, and finally off to the flour bleacher. Now was

that the kind of a machine you had? A. No, sir.

Q. Well, it was the same principle exactly, wasn't it, except you only had one tank instead of three? A. No, sir.

Q. Well, you had one tank between the gas generator and the flour agitator? A. Yes, sir.

Q. And there is three indicated on the picture?

A. Yes, sir.

Q. So it was the same in principle, was it not, except in your instance you only had one tank, where Mr. Mitchell's picture there has a system of three?

A. There is a difference just the same.

# By the Court:

Q. Sir?

A. There is a difference, there is a mechanical difference.

By Mr. Butler:

Q. I know, but I mean as far as the number of tanks and connection is concerned, it is the same in number.

A. No, we had one tank, and here you have three tanks.

Q. That is what I say, except that you had one and they had three?

A. There is still a difference.

### Cross-Examination

By Mr. Smith:

Q. You have been employed at this mill how long?

A. Three years.

Q. And prior to being employed in this mill where were you employed? A. Gothenburg.

Q. Nebraska? A. Yes, sir.

Q. How far is that to this mill?

A. 25 miles.

Q. In the same county? A. Yes, sir.

Q. And during the six years that you have been employed in those two mills in what capacity have you been employed?

A. Head miller.

Q. Do you purchase the wheat that is bought by the Lexington mill? A. No, sir.

Counsel for the Government objects as incompetent, irrelevant and immaterial,

The Court: He says no.

Q. Do you examine the wheat as it comes to the mill, or do you examine it before it goes over the rolls?

A. I examine it before it goes over the rolls.

- Q. I see, and have been doing that all the time you have been head miller at these two mills? A. Yes, sir.
- Q. And in that way have you become familiar with the grades and kinds of wheat raised and on the market there in Nebraska? A. Yes, sir.

249 Q. Now tell the jury what was the grade of wheat that was used in milling this flour?

A. It was a grade of wheat as we get in that part of the country, it [—] what we call a No. 2 hard wheat.

Q. What is the fact as to whether or not there is any wheat raised or on the market there that grades No. 1 hard wheat?

Counsel for the Government objects to the question as immaterial and not cross-examination.

The Court: He may answer.

A. No, there is no No. 1 hard wheat.

Q. Was there any soft wheat purchased?

Mr. Butler: I object to it as not cross-examination because we are compelled to call our adversary. Now if they want to prove that this is the first quality hard wheat, it is for them to prove it on their side of the case. He said that there was certain wheat there and he mentioned one yellow belly or berry from 10 to 30 per cent, and it might be as high as 50 per cent. Now may be that is the best wheat in the world, I never was in—

The Court: That is the trouble, Mr. Butler, I don't know what this yellow berry is. He may answer it, I think now.

Mr. Butler: Your Honor will observe that I did not call for the quality of wheat at all, and I certainly shall contend that we are at least not bound by the opinion.

The Court: You used some of those two at some time evidently.

Mr. Butler: I at least observe we are not bound by the opinion?

The Court: He may proceed.

(Question read by the reporter.)

A. No, sir.

Q. Mr. Butler asked you a question in regard to wheat that is called a yellow berry. Is the yellow berry a hard wheat or a soft wheat? A. Hard wheat.

Q. What is the other name that is applied to other kind of

hard wheat that you got there—turkey red?

A. Turkey red.

Q. You refer to some kernels as turkey red and some of it as yellow berry? A. Yes, sir.

Q. Now do you know whether or not they grow in the same

field? A. Yes, sir.

Q. From the same seed?

A. That is my opinion that they grow from the same seed.

Q. Yes, whether or not wheat is referred to as turkey red or yellow berry, is dependent, is it not, somewhat upon the character of the soil in which it grows?

Mr. Butler: We really don't think that this miller is qualified as an expert on that question—the causes of the color of grain.

The Court: Well, he may answer.

(Question read by the reporter.)

A. I think it is.

Q. And it is true, is it not, that if a farmer sows turkey red wheat that in the harvesting as he comes to the mill there will be some grains in there which in trade will be regarded as

turkey red and some as yellow berry; that is true, is it?

A. Yes, sir.

Q. But it is all hard wheat on the market, isn't it?

A. Yes, sir.

Q. You say it is wheat that was used to make this flour?

A. Yez, sir.

A. Yes, sir, I saw it.

The Court. Flour that was seized.

Q. Yes, flour that was seized? A. Yes, sir.

Q. And I want you to tell the jury whether or not from your knowledge of wheat there in Nebraska, the wheat that is on the market, the wheat that the farmers brings to the mill, whether or not that was or was not first quality hard wheat?

A. Yes, sir, it was.

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### Redirect Examination

By Mr. Butler:

Q. Do they sow yellow belly; do the farmers seed yellow belly? A. I suppose they do.

Q. And when they seed yellow berry does that produce something else, or does it produce yellow berry?

A. The farmer does not intentionally seed yellow berry.

Q. Well, I don't care about his intention, it will grow just the same no matter whether he intended to do it or not. Now when he seeds yellow berry does it produce some other kind of wheat or does it produce yellow berry?

A. It is possible for it to produce a turkey red wheat. Q. Yes, the first quality hard wheat? A. Yes, sir.

Q. A dirty first quality hard wheat.

A. A turkey wheat I said.

Q. I misunderstood you, I thought you said a dirty. Have you ever known that to be done. A. Not absolutely.

Q. You say the farmers do not intentionally sow the yellow

berry? A. No, sir.

Q. Now if it is the first quality hard wheat and will produce the first quality hard wheat why isn't it selected as seed and all the rest thrown away?

Counsel for claimant objected.

The Court: He may answer.

A. That is a mighty hard question to answer, for the simple reason that it would take a mighty lot of machinery to separate the yellow belly from the red turkey wheat.

Q. But then if you were a farmer and could get a yellow belly, you would prefer to sow it because it is the first quality hard wheat? Counsel for claimant objected to the question as incompetent, irrelevant and immaterial.

The Court: Well, there was some question as to whether or not he was an expert on wheat raising, but I think he ought to answer. He may answer this question.

A. I would not choose a yellow berry wheat for seed.

Q. You would prefer to choose turkey wheat, wouldn't you?

A. Yes, sir.

Q. And financial or pecuniary considerations would be what determines you about that?

Counsel for claimant objects to the question as not proper

Mr. Smith: Getting into bulls and bears again, that's all.

# Recross Examination

By Mr. Smith:

Q. I wish you would describe this tank that Mr. Butler asked you concerning, the storage tank, where it is located and how it operates and so forth?

A. The storage tank is located about half way between the

electrifiers and the agitators.

Q. Do pipes from each of the generators run into this storage tank?

A. No, the pipes run into the "T" and the one pipe runs

to the storage tank.

Q. Well, run to the "T" and then are they connected by one pipe to the storage tank. A. Yes, sir.

Q. Then how many pipes are there connecting the single

tank with the agitator? A. One.

Q. And what is the length of the pipes from the electrifiers to the storage tank? A. About 15, 16 feet.

Q. Yes, and what is the size of that storage tank?

By the Court:

Q. Gallon, barrel or what, how large is it?

A. It is a round tank about 4 by 8 I should think.

Q. Inches? A. No, feet.

# By Mr. Smith:

Q. Four feet?

A. Four feet in diameter by eight feet high.

Q. What is it made out of? A. Made of galvanized iron.

# By the Court:

Q. That is the tank? A. Yes, sir.

By Mr. Smith:

Q. And then how far is it from the tank to the 253 agitator? A. About 15 feet.

Q. The agitator is that through which the flour sifts?

A. Yes, sir.

Q. And what sort of a pipe connects the storage tank with the agitator? A. Galvinized iron pipe.

Q. More than one? A. No, sir, one.

Q. How large a pipe?

A. Two inch, I believe it is 2 inch, that is approximately two inches on the outside.

Q. Are you giving the outside measurements?

A. Yes, sir.

Q. About two inches in diameter outside measurement?

A. Yes, sir.

- Q. Has that pipe ever been taken out and removed while you have been there; did you ever have to take it out to clean it.
  - A. Yes, I have taken it out once or twice to clean it.

Q. Has a new pipe ever been substituted while you have been there? A. No. sir.

Q. Have you ever been able to observe any eating or corrosion on that pipe? A. Not to speak of.

By Mr. Butler:

Q. Not to speak of.

By Mr. Smith:

Q. Well, have you any at all either inside or outside, if you have I want you to describe it?

A. Not that I have ever detected.

Q. You say it is taken out occasionally and cleaned?

A. Yes, sir.

Mr. Butler: Why, Mr. Smith, let him tell what is in it.

Mr. Smith: Haven't I a right on cross-examination, to put any question I want to—leading.

Mr. Butler: I object to the question as leading and suggestive and not cross-examination.

Mr. Smith: If it is not proper-

The Court: This is a new subject matter, no doubt about that, but you said the witness wanted to leave, he may answer, but I doubt whether you ought to lead him.

Q. Well, you may state what it is that gathers on the inside and why you take out the pipe to clean it, remove it, what do you do?

A. Well, the electrifiers are supplied with a supply of fresh air from the bottom of each machine by means of a pump that goes up and down in that air, and every flour mill has certain quantities of dust in it, and this pumps this dust in at the bottom, and as it is forced through this flaming arc, it is my opinion that the flaming arc burns that to an ash which collects in the pipes.

Q. And that is what you took it out to remove?

A. Yes, sir.

Q. So that the air can circle through it more rapidly?

A. Yes, sir.

### 2d Redirect Examination

By Mr. Butler:

Q. What kind of a pipe is that; is it an iron pipe?

A. Yes, sir, it is a galvanized iron pipe.

Q. And your idea is that the natural accumulations on the inside of the pipe is the ash that results from burning the dust in the air that is pumped through the gas generator; is that right? A. That is my absolute opinion.

Q. That is your absolute opinion, that this pure air that is pumped into the gas generator, when the impurities are consumed, accumulate so much ash that you have had to take the pipe out to clean out the ashes from the dirt burned out of this pure air? A. Yes, sir.

Q. Now is there anything to prevent—is there any valve that will let this air go through the pipe from the tank to the agitator which will keep the ashes and dirt and results of

combustion from going into the agitator?

A. Well, the storage tank for the gas is sufficiently large that when this air is pumped into this storage tank, where it has a chance to spread out, it will naturally drop a dust.

Q. In the tank?

A. When it spreads it will drop the dust and the dust will go partly to the bottom of the tank and some may go on through with the air, but the natural philosophy of the

255 thing is that where it has a chance to drop, that it will

drop, the principal part of it.

- Q. Then is this which is in the pipe leading from the gas generator to the agitator, for the purpose of catching these ashes and product of combustion that is taken out of the pure air? A. No, sir.
  - O. But it does catch it?
  - A. It does catch some of it.
- Q. But a good deal of this is blown right straight through into the flour, isn't it?
  - A. Well, I couldn't say that there is any.

Q. Well, what is there to stop it as a mechanical method.

There is nothing to stop it except this one tank. Q. How long ago is it since you cleaned out that pipe?

I should think it is about a year ago. A.

What was the color of the stuff you took out of the pipe? A. It was a dark brown substance.

Brownish? A. Yes, sir.

Q. Now darker than ashes, ordinary wood ashes?

Yes, sir.

It was darker than the air that comes from burning up the flour?

A. I never burned up any flour, I don't know, I never

HAW-

You never saw. A. Flour ash, no, sir.

Q. You never saw the flour, say how would it compare with this stone here, I am a little color blind and I won't undertake to say what color it is, but was it something the color of this stone? A. It is a trifle darker than that stone.

Q. Now the stone is mottled in appearance, and how did it

compare with the darker colorings of this stone here?

Well, I should say that it was all about that shade, I couldn't say definitely, but I think that it is about the shade of the darker spots on that stone.

And it was fine like ashes? A. Yes, sir. Q.

No scales there? A. No.

What? A. No, I don't think there was any scales. Q. Do you clean that pipe yourself personally, or just tell the boys take it out in the air and clean it? 256 Well, I have cleaned it personally myself.

Q. How many times?

- Well, I remember of cleaning it once personally myself.
- Now what I am trying to get at, was this substance Q. scaly?

No, I don't think that it was; I wouldn't say that it

was scaly and it has been a year ago.

Did you smell of it, of the substance that came out. Not more than just working with it in that way. A.

Did you detect any odor about it? Q.

Yes, sir, a slight odor. A.

What did it smell like "Exhibit 6" in this court room? Q Well, I couldn't say definitely that it smelled the same

as that, it may have had that-

Pungent odor? Q.

- Yes, sir, it may have had some of that odor. A.
- That is the substance that came out of the pipe? Q.

Yes, sir. A.

Did you ever clean your tank since you put it in?

Yes, sir.

Q. How many times? A. I have only cleaned it once.

Q. Once, when was that.

A. I think it was-Oh, it is probably two years ago.

Q. Galvanized iron tank? A. Yes, sir.

Q. Did that stuff have the same odor as the gas in the "Exhibit 6" here? A. Somewhat.

Q. Somewhat the same odor. How much stuff did you take out of that tank, how many quarts or pints or ounces or gallons when you cleaned it?

A. Oh, possibly half a bushel.

Q. Half a bushel, and that was about as dark as the darkest portions of this stone at the clerk's desk?

A. Yes, sir.

Q. And it smelled with that peculiar pungent odor?

A. Yes, sir.

Q. Of the gas in the bottle here?

A. Yes, sir, to some extent, I would not say exactly.

Q. You were in the court room when that bottle was open yesterday, were you? A. Yes, sir.

Q. And you smelled it where you were, did you?

A. Well now, I could have drawn on my imagination,
157 I have smelled it, I suppose, but to swear that I smelled
that odor, I could not do it, I was sitting in the back
part of the house there.

Q. Did you ever smell any gas around the gas generator?

A. Yes.

Q. And your imagination suggested that this was exactly the same as that in smell, except as to strength, wasn't that it?

A. No, I would not say that it was exactly the same.

Q. Well, like it, similar to it?

A. Somewhat, I am not-

Q. It is hard to tell how anything smells except by saying it smells like that thing or this thing or the other, I don't know in words to tell it. Did you ever open the agitator when the gas was blowing in there? A. Yes, sir.

Q. Did you smell it? A. You can smell some of it.

Q. Did you ever open the spout that was running down from the agitator into your bin? A. Yes, sir.

Q. Did you smell it?

A. Yes, sir, you can smell some.

- Q. Did you ever go down in the flour bin? A. Yes, sir.
- Q. Where the flour bin was coming fresh from the bleachers? A. Yes, sir.

Q. Did you smell it. A. Yes, I smelled some gas.

Q. And it smells just like this gas in court, doesn't it?

A. I wouldn't say that.

Q. Well, similar, the same pungent smell?

A. I don't know what pungent is?

Q. Neither do I, that is what you and I are alike about that. Now so we'll know what kind of looking stuff that was in the pipe, what kind of a spout did you have running from the agitator that you ran out into the bin first, did you?

A. Yes, sir, I dropped—

Q. Now this bleaching is at the end of the mill, isn't it?

A. Yes, sir.

Q. Right after the milling?A. At the end of the system.

Q. I mean of the mill, the system called the whole thing,

the mill? A. Yes, sir.

258 Q. And it could be taken out and you would have your mill complete without the agitator the mill would be complete, if you didn't want to bleach it, simply move this agitator aside and connecting your spout direct with the bin, wouldn't it? A. Yes, sir.

Q. And so the only change involved would be setting that thing aside, and take this pipe instead of running it into the agitator run it into the bin or sacks or barrels or whatever you wanted to do with the flour; that is right isn't it?

A. Yes, sir.

- Q. Now what kind of a spout did you have conducting the flour out of the agitator? A. We have a straight spout.
  - Q. Is it square? A. Yes, sir. Q. All around? A. Yes, sir.

Q. And right angle corners? A. Yes, sir.

Q. And does it run straight down or does it run slanting?
A. Well, it runs very nearly straight; I have a valve so that

I can throw it into shift bins if I wish.

Q. Now did you ever have occasion to clean out in that spout, did it ever clog or stop? A. No, sir.

By the Court:

Q. Sir? A. No, it has not.

By Mr. Butler:

Q. But the flour coming out at the end in the bin has this odor that we have referred to?

A. Yes, it has some of the odor.

Q. Now does not flour accumulate in the angles a little, just a little ribbon of flour down along the corners of your spout?

A. Well, I have seen that accumulate in spouts in the mill.

Q. Yes, and I am speaking of this mill now.

A. Well, I couldn't say as to this special spout that we are

speaking about.

Q. Haven't you observed, or have you observed, I don't know whether this incline is right, that that flour that so

accumulates and stops there for some time, that it does not keep running right along but lets the flow go by?

A. Yes.

259 Q. That that flour turns about the same color as the stuff that you take out of the tank and out of the pipe between the gas machine and the agitator?

A. No. I have not observed that.

Q. Yes, that has not come within your notice?

A. No, sir; it is possible there has not been sufficient to notice it.

Q. Did you ever clean out the agitator yourself?

A. No, sir.

Q. Ever open that up when you were not running?

A. No, sir. I never opened up the agitator.

Q. It has never been opened up in your time then?

A. No, sir.

Q. Is that round? A. Yes, sir.

Q. And the bottom flat?

A. No. sir, the bottom is round too.

Q. The bottom is round too; what is it made of?

A. It is made of galvanized iron.

Q. The agitator is too? A. Yes, sir.

Q. And that is in such shape it stands up and down, does it, so that nothing can stick in it?

A. No, sir, it is a horizontal machine.

- Q. Well, what I am trying to get at is this, in the ordinary operation could it be possible that a little flour, an ounce or a pound or a gallon might stay in there?
  - A. Yes, sir.
  - Q. For a while? A. Yes, sir.

Q. For a good while? A. Yes, sir.

Q. Now have you ever observed flour that you know had stayed in that tank for a few days while you were bleaching?

A. No, sir.

Q. Can you tell us whether or not that flour would become the same color practically a saffron color, the same color as this stuff you took out of the tank and the pipe?

Mr. Smith: I object to that as wholly speculative. The witness said he never observed, he never seen any of it.

The Court: Yes, he says he has not examined it.

Q. Where did the 10 per cent of flour that was not put in these sacks go, when it left the mill, what spout is it run inte?

It ran into the Lexington packer or the clear packer which we call our Lexington.

260 Q. Lexington packer or the clear packer? A. Yes, sir.

That did not pass through the agitator? A. No, sir. Q.

Q. That was not bleached? A. No, sir,

Now do you know yourself what bin that ran into? Q. A.

Yes, sir.

Q. And you know it was the Lexington packer or what?

A. Clear.

- Yes, and with reference to the name, it is different kind Q. of flour?
  - Well, Lexington, we brand our clear flour Lexington. A.

Q. Lexington or clear?

Well, it is just branded Lexington. A.

Q It is not branded clear, branded unbleached?

A. No. sir.

Counsel for claimant objects as immaterial and not therefore in this case.

At this point a recess was taken until 2 o'clock p. m.

Friday P. M., June 3, 1910.

Court met at Two o'clock P. M. and proceeded as follows:

Mr. Butler: I ask permission to ask Mr. Tucker a question or two, that I overlooked.

The Court: Yes. Do you want Mr. Elliott present, Mr. Smith.

Mr. Smith: He is here.

The Court: Oh, yes, Mr. Elliott is here. Very well.

Overton T. Tucker, recalled, was examined further, and testified as follows:

By Mr. Butler:

What was the date of the milling and bleaching of the Q. flour that was seized in this case?

261 A. I don't exactly understand.

Q. On what date was the flour milled and bleachedthat is, the flour that was seized in this case, down at Castle? A. On the night of the 31st of March.

The Court: This year?

A. Yes, sir.

By Mr. Butler:

Q. What was the average daily output of the mill per

year?

A. I don't believe that I have the average daily output of the mill for a year.

Q. Could you give us within the limits?

A. Do you mean, running twenty-four hours?

- Q. No, I mean how much flour did you make in the year, and that divided by the number of days you made it, which would give the average daily output?
  - A. 330 barrels, about.

The Court: Per day?

A. Yes, sir, per day,-twenty-four hours,

By Mr. Butler:

Q. What is the theoretical capacity of your mill?

A. Oh, about 350 barrels.

Q. Per day? A. Yes, sir.
Q. Do I understand you to say there is only one agitator there for the bleaching of flour?

A. Yes, sir, only one agitator for the patent.

The Court: Sir?

A. Only one agitator for patent flour.

By Mr. Butler:

Q. And you told me you didn't bleach the clear?

A. No, sir, we do not.

Q. No? Only bleach the patent? A. That is all. Q. How many agitators do you have in the mill?

A. Two.

Q. Two agitators in the mill? A. Yes, sir.

Q. Both used for bleaching patent? A. No, sir.

Q. Did you bleach the clear? A. No, sir.

Q. What were they used for, at that time?

262 A. They weren't used at that time.

Mr. Lyons: I didn't catch the answer.

A. There was only one agitator in use. There was only one agitator in use for the purpose of bleaching.

By Mr. Butler:

Q. What was the other one used for?

A. The other agitator was put in there, when the machine was installed.

Q. What was it put in for?

A. It was put in there for the purpose of bleaching cut straights.

The Court: Bleaching what?

A. Cut straights, and I believe—I understand that before I came there, that they did bleach their clears, but we have never bleached any clears, since I have been there.

Q. What is a cut straight?

- A. A cut straight is the clear, and a per cent of patent, turned in with the clear.
  - Q. What percentage of the whole flour is a cut straight?

A. About forty per cent.

Q. And that, would leave a sixty per cent patent?

A. Not necessarily.

Q. Yes,-the whole flour content is one hundred per cent?

A. Yes, sir.

Q. Then you divide that so as to make sixty per cent of it patent, we will say. That would leave forty per cent, and that you would call a "cut straight"? A. Yes, sir.

Q. When you make a short patent, like sixty per cent, you

call the balance not a clear, but a cut straight?

Q. That isn't a short patent.

- Q. Well, when you make it no longer than sixty, we will say?
- A. That don't make any difference. It doesn't shorten that patent a particle.

Q. No? Well, see, if I understand this right.

A. Straight flour is all the flour in the wheat, is it?

A. Yes, sir.

Q. A patent is some of the flour in the wheat, is it? A. Yes, sir.

263 Q. What is left, is a clear? A. Yes, sir.

Q. But now, a cut straight is after you have taken some patent off, and not all of it that is in the wheat? You have taken all the patent off?

A. I turn a part of it back into the clear.

- Q. Do you take all of it back and turn it back in there?
- A. Yes, regular separations are made, but a portion of it is turned back into the clear.

Q. What is a "first clear"?

A. A first clear is a baker's flour, or a flour that is termed a baker's flour. It is a regular clear flour.

Q. What per cent?

A. Oh, that is indefinite,-most any per cent.

Q. What is a second clear?

A. A second clear is the poorer qualities of the first clear—the quality that is not fit for a first clear, the way I understand it. I don't make a second clear, but I am simply giving you my understanding of a second clear.

- I see. Now how many bushels of wheat did you use to make a barrel of the flour that was seized?
  - I don't figure by the barrel. Q. Well, one hundred pounds?

I would have to figure that. A.

Well, one hundred pounds. How do you figure? Q. I figure the number of pounds of flour to the bushel of A. wheat.

How many pounds to the bushel of wheat? Q.

A. About forty-two pounds. About forty-two pounds? O.

The Court: Sixty pound bushel of wheat?

A. Well, fifty-nine pound bushe, of wheat, That is allowing one pound for sweeping it.

By Mr. Butler:

Q. Forty-two pounds of flour, out of fifty-nine pounds of wheat? A. Yes, sir.

And your statement was, that there was ninety per cent Q. of the flour bleached? A. Yes, sir.

Q. And put into the bags which were seized? 264

A. Yes, sir.

And ten per cent of the flour was-what you call it, something else-was a clear flour?

A. Yes, sir.

Q. And was not bleached? A. Yes, sir.

Q. And that was put into another sack, and branded some-

thing else? A. Correct.

Now, I want to get the mechanical detail of the connection of the two agitators. By the way did you run all of your patents into the bleacher, at once?

A. Yes, sir.

There were no separation of streams of patent? ().

A. No, sir.

You didn't run some streams into one agitator, and some into another, and then bring them together?

Well, no. A.

You understand what I mean?

A. Yes, sir, I understand what you mean.

Q. Yes?

That the streams all ran into one elevator, and that elevator carried it to the agitator?

Q. Yes?

And just one agitator? A.

Now, you have two gas generators? Q.

Yes, sir. A.

Q. And the pipes ran into a "T",—the pipes conducting the gas ran into a "T"? A. Yes, sir.

Q. And the "T" ran into the tank—they formed a "T"?

A. The "T" ran into ne tank.

Q. Then, there was a pipe running out into the tank?

A. Yes.

Mr. Smith: By that, you mean the reservoir?

Mr. Butler: Yes. That is the galvanized iron tank, that you cleaned out? A. Yes.

Q. And then, from that tank, there was a pipe coming out of the other end, I suppose, to let the gas out of it?

A. Yes, the pipe comes out at the bottom of the tank.

Q. Now, that pipe separated some place, so that,—was that made in two branches, later on, so that one branch of it went into one agitator, and the other to another?

A. Yes, sir.

Q. And it had an arrangement so that you could turn it off of one agitator? A. Yes, sir.

Q. And turn it-

A. (Interrupting) On the other agitator.

Q. The other agitator? And you said that the night in question that clears were not put through that agitator?

A. No, I didn't say that. I said they were not bleached.

Q. Were they put through the agitator?

A. They were put through that clear agitator, yes, sir.

Mr. Smith: Not the same agitator.

Mr. Butler: No, I understand.

Q. So, both agitators were in use, that night?

A. Yes, sir, both agitators were in use.

Q. Both gas generators were in use? A. Yes, sir.

Q. And all the gas that was made, from both, was turned onto the flour that was seized? A. Yes, sir.

Q. And none of it was turned onto the other?

A. No, sir.

Q. Was there some mechanical reason, or some reason, Mr. Tucker, founded on convenience, why you should run this flour that you didn't bleach, through the bleaching agitator? What was it?

A. Well, it was just simply the way the flour is conducted.

Mr. Smith: Speak up a little louder.

A. The agitator is there for that purpose, at the same time acting as an agitator it conducts the flour to that bin.

Q. Yes, I know. It would run through there, whether the gas was coming in, or not? A. Yes, sir.

Q. But my idea was this: Can't you just turn the spouts around there? Isn't there some way to get around it, without going through? A. No, sir.

Your mechanical situation is such that it has to run

through the agitator? A. Yes, sir. Q. Was the agitator running? 266

A. The agitator was running.

Yes? So that that would not be a sign, if two of these Alsop Gas Generators were running, and flour coming into the agitator, and the agitator running-that wouldn't be a sign that it was bleached? A. No, sir.

So, you may go and open that agitator and get no smell

at all, of gas?

A. Yes, you could go and open that agitator, and get no smell of gas.

Q. How long have you been there at that mill?

Three years. A.

And the clear always comes down through that same agitator? A. Yes, sir.

Q. And never was bleached? A. No, sir.

You just kept running that agitator there, just to let the flour go by? A. Yes, sir. Q. All that time? How big is that agitator?

- [Q.] It is about half the size of the other agitator. And that would be about as big as a barrel, or hogshead?
- That would be about fourteen inches in diameter, and A. about six or seven feet long.
- Q. Yes? It would be a very easy matter to slip that out, and put a spout in its place, wouldn't it?

A. It would, if you never wanted to use it.

- Yes? That is what I say; and you had it there, running, all this time-two or three years,-without wanting to use it?
  - A. Oh no, I never said that. I never made that statement.
- Q. Well, your clear has been going down there for three years, hasn't it? A. Yes, sir. Q. And you never bleached your clear in that three years?

A. No. sir.

Q. Did you ever run the patent through there?

A. No, sir.

Mr. Butler: I think that is all.

# Cross Examination.

Questions by Mr. Smith: 267

Q. An agitator is a necessary part of the mill, irrespective of the question of bleaching, is it not?

A. No, I could not say it was, Mr. Smith.

Q. An agitator?

Mr. Butler: Why, no, I don't understand that.

By Mr. Smith:

Q. Describe to the jury what you mean by an agitator.

A. An agitator is the mechanical machine for spreading this flour, so that the treated air can have an effect on each particle of flour the same. It is simply an agitator for stirring up the flour, as it goes into the bin, and spreading it, that each particle of it may come in contact with this treated air.

Q. I see. That is all.

By Mr. Butler:

Q. Then an agitator would be, in the Alsop process,

around at the end of the mill?

A. Not entirely like that. I have seen agitators that were put in, practically for the simple purpose of drying and removing a certain amount of the moisture.

Q. Yes, to dry out the flour? A. Yes, sir.

Q. But this is to get this gas, that you call the treated air—this gas that you smell,—mixed in with the flour? That is what it is for, isn't it?

A. Yes, sir, that is what it is for.

Q. So that it will come in contact with each little yellow portion in the oil, or fat of the flour, and make it white? That is the purpose of the agitator, isn't it?

A. Yes, sir, that is the purpose of the agitator.

The Court: Are you through with this witness, gentlemen?

Mr. Smith: Yes.

The Court: I guess that is all, Mr. Tucker.

Mr. Tucker: Am I -

268 The Court: Well, that is for counsel to say: Mr. Tucker wants to know if you are through with him, on both sides?

Mr. Smith: We expect to recall Mr. Tucker, when it comes to our case. It is a matter for the government to say whether they want to retain him here, or not.

The Court: You are in the hands of your own counsel.

Mr. Butler: So far as I know, we will not, but I would like to have Mr. Tucker say that if we wire him, he will come back.

Mr. Tucker: Yes, sir.

Mr. Butler: He said he would prefer to do that.

The Court: If you receive a call from Mr. Butler, you will please come back. Otherwise, you are subject to the orders of Mr. Smith and Mr. Elliott.

Mr. Lyons: Just go into my office, and the lady clerk will give you your discharge.

Witness Excused:

Daniel M. Walsh, called as a witness on behalf of the Government, being first duly sworn, was examined by Mr. Butler, and testified as follows:

Mr. Walsh, you are employed by the Government? Q.

Yes, sir. A.

Q. What is your official capacity?

Food and Drug Inspector, in the Bureau of Chemistry, United States Department of Agriculture.

Q. Bureau of Chemistry, Department of Agriculture?

A. Yes, sir.

Did you see the flour which has been seized in this case, Q. at all, about the time of its seizure, at Castle, in this State?

A. Yes, sir. 269

The Court: Is that Castle, or Greencastle?

Mr. Butler: The Post Office is called Greencastle, and I think the railroad station is called Castle.

The Witness: Yes, sir.

The Court: Very well, we will know what is meant, then. I notice that confusion of names, and I didn't understand it.

Mr. Butler: It has been so explained to me.

The Court: So, when you said "Castle", or "Greencastle" you mean the same place-where this gentleman lives, who testified here, as a grocer.

By Mr. Butler:

Q. Did you take any of this flour, for examination, and send it to any of the laboratories of the Government?

Yes, sir. A.

When did you take it? Q.

I will have to consult my record. A.

You made a note of it, at the time, did you? Q. Yes, sir. I took it April 11, 1910. A.

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Q. At Castle? A. At Castle, Missouri.

Q. How much did you take? A. I took three sacks.

Q. And what did you do with them?

A. I sent two sacks to the Chicago Laboratory.

Q. That is in charge of whom?

A. Doctor A. L. Winton, and one sack to the Saint Paul Laboratory, in charge of Doctor A. S. Mitchell.

Q. Did you mark and seal the sacks so as to preserve the chain of identification? A. Yes, sir.

Q. Have you seen the sacks here, since you came to Court?

A. Yes, sir, both of them.

The Court: Both, or three?

A. Both sacks. Both samples. There was two samples. There were two sacks in the sample sent to Chicago and one ock in the sample sent to Saint Paul. I have seen two sacks from the Chicago shipment, and one from the Saint Paul shipment.

270 Q. Are they in the Court, Mr. Walsh?

A. Yes, sir. Right by the gate, there.

(Sacks produced)

Q. These sacks were tied up, as is usual, when you shipped them? A. Yes, sir.

Q. How did you ship them-by what carrier?

A. Shipped them by Adams Express.

Q. How did you mark them?

A. I marked the samples sent to the Chicago Laboratory, "I. S. 12351 -B", and the sample sent to the Saint Paul Laboratory, "I. S. 12352 -B".

Q. Will you come down here, and see if this sack, I have, now, is the same sack, and which was full, when you sent it? It is partly full.

A. Let me have the box, please. This is the sample that I sent to the Chicago Laboratory.

Q. That is one of the sacks you sent to the Chicago Laboratory? A. Yes, sir.

Mr. Butler: Now, we will have this one marked "Government Exhibit 8".

Q. Now, look at this other sack, and see if that-

The Court: Well, just wait, Mr. Butler. They have got some tags. This one should be marked, now.

(The sack of flour identified by the witness is here marked "Government Exhibit 8")

Q. I show you another sack?

This is the sack that I sent to the Saint Paul Laboratory.

Mr. Butler: We will have that marked "9".

(Which is accordingly done)

Mr. Butler: There is no dispute about their all being labeled alike, is there?

Mr. Smith: They are, so far as I know.

Mr. Butler: These exhibits will be offered in evidence 271 and attention is called to the label upon them. It is admitted-it was pleaded in the libel that each sack was labeled as these are, except in this way. "This flour is Made of First Quality Hard Wheat", is the way it reads on the sack. The libel said, "Finest Hard Wheat" and the answer said "First", so, I think it may be taken as the fact, that the answer is right in that respect.

The Court: You may, by interlineation, of your amended libel, correct it, if you care to.

Mr. Butler: Well, it may be so considered. I think that is all, Mr. Walsh. Cross-Examination.

Questions by Mr. Smith:

Q. One question, Mr. Walsh. You didn't open the sack, at Castle? A. No, sir.

Q. And when did you next see them?

I next saw them in the court room here.

The Court: A day or two ago?

A. Yesterday.

By Mr. Smith:

So, all you are able to do, is to identify certain markings that you made? A. Yes, sir. Q. At that time? A. Yes, sir.

Q. You have no knowledge of the contents, at any time?

No, sir.

Mr. Smith: That is all.

Mr. Lyons: That is all.

Mr. Smith: No, there is one question I want to ask, please.

Where was this flour, when you seized it at Castle? It was in the dealer's warehouse.

The Court: This gentleman who testified—what is his 272 name?

The Witness: B. O. Terry.

By Mr. Smith:

Q. Mr. B. O. Terry's warehouse? A. Yes sir.

Q. Where was his warehouse?

A. It was in the rear of his store.

Q. How far from the depot?

A. Oh, I should say a quarter of a mile.

Q. Were any of the sacks in his store proper?

A. I think not,

Q. Well, are you clear about that?A. Yes, I am very clear about it.

Q. All of it piled together, was it? A. Yes, sir.

Q. The warehouse—where is that, with reference to his

store-grocery store?

A. Well, it is practically the same building. It is—the front part of the building is a retail store, and the rear part is a warehouse. This flour was up-stairs, in the rear part.

Q. And the rear part is where he stored articles of mer-

chandise, that was there for sale?

A. There was practically nothing stored in the upper part, except this flour.

Q. That is, in the up-stairs? A. Yes, sir.

Q. But, in the rear part, that was used as a storage room, in connection with the grocery store? A. Yes, sir.

Q. Well, you say there was "practically" nothing else stored up-stairs, except this. Do we understand that there were some other articles of merchandise stored up there?

A. I believe there were some boxes, up there, something of

that kind.

Q. I see. Do you know how many sacks you seized, there, at that time?

A. Yes, five hundred ninety-seven. I am not sure about that.

Q. You are not clear, as to the exact count?

A. No, sir.

Q. Did you see Mr. Terry sell any of them, while you were there? A. Selling any of the flour?

Mr. Butler: We will object to that, as immaterial, and 273 not cross-examination.

The Court: If it has reference to any question of identity, it would be proper. I don't know what the object is. You may answer.

A. No, sir, I did not.

Mr. Smith: I guess that is all.

Witness Excused.

Dr. Andrew L. Winton, called as a witness on behalf of the government, being first duly sworn, testified as follows:

#### Direct Examination

By Mr. Butler:

Q. Where do you live, Mr. Winton? A. Chicago.

Q. What is your occupation?

A. Chemist, chief of the government's food laboratory at Chicago.

Q. Give to the jury a statement of your education and pro-

fessional experience, or history.

A. I was educated at Yale University.

## By the Court:

Q. Yale?

A. Yale, where I received the degree of Bachelor of Philosophy, and later, of Doctor of Philosophy. For twenty-three years I was chemist at the Connecticut Agricultural Experiment Station. During eighteen years of that time, I was in charge of the analytical laboratory. Since the spring of 1907, I have been in my present position. I have written various articles on the analysis of agricultural products, and foods, which have been published in journals and state reports. I also was one of the authors of the compilation of analyses of

American feeding stuffs, including food for man, as well as feeds for cattle, which was published by the De-

partment of Agriculture about twenty years ago. Also author of a book on the microscopy of foods and translator of a work on the microscopy of technical products. Both of these books deal with cereal products, and flour, touching also on the chemical composition of flour. More recently, I took part in the revision of Leach's "Food Inspection and Analysis".

## By the Court:

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Q. What kind of food inspection?

A. Leach's. Leach's—that is the author. "Food Inspection and Analysis", which is a work dealing with the composition and analysis of food products.

Q. Exhibit 8 is called to the attention of the witness, same being one of the sacks shipped by Walsh to the Chicago laboratory. When did you receive that sack, Doctor?

A. April 12th, of the present year.

Q. Was it full of flour, at that time? A. It was.

Q. It has been in your custody and control since that time?

A. Yes, sir.

Q. There is still some flour in it—perhaps less than half full—do you know whether or not this is a part of the same flour, originally contained in the sack, when it reached you, that is now in it? A. It is.

Q. You received two sacks, I believe, all together?

A. Yes, sir.

Q. The other one you shipped to Washington?

A. Shipped to the Bureau of Chemistry, at Washington.

Q. They were both contained in a wooden box, which has been moved around here, when they arrived at the Chicago laboratory? A. Yes, sir.

Q. Did you make an analysis of the flour contained in this

sack, Exhibit 8? A. I did.

Q. When did you make that analysis?

A. On the day the flour was received from the express company.

Q. What was the purpose of the analysis, or for what

275 determinations was it made?

A. The purpose was to learn whether or not the flour had been bleached, and also what was the grade of the flour.

Q. Now, state what you found as the result as the result

of your analysis—that is, what it contained.

A. It contained nitrous acid, either free or combined to form nitrites, 1.80, calculated as nitrogen, per kilogram of flour. 1.80 milligrams, calculated as nitrogen, per kilogram of flour, or, in other words, 1.8 parts per million.

Q. What did you call it? A. Nitrous-nitrogen.

Q. Nitrous-nitrogen? Is that nitrite reacting material, or the equivalent?

A. It is, calculated to the form of nitrogen.

Q. What else?

- A. It contained .57 per cent of ash, and acidity, calculated as lactic acid, .113 per cent.
  - Q. That is, one hundred thirteen thousandths?
    A. One hundred thirteen thousandths per cent.

Q. That is, of one per cent?

A. Of one per cent. And it had a gasoline number, sotalled, of .66. This gasoline number is a measure of the color of the flour, extracted by gasoline.

Q. Anything else? You have given us the nitrites, and

the ash, and the acid, and the gasoline number.

A. In addition, determinations were made of the gluten.

Q. What did you find?

A. And baking tests were also made.

Q. Now, we will go back to the chemical analysis. It is admitted in this case that this flour was bleached by the Alsop process. Are you familiar with that process? A. I am.

Q. Have you given special attention to it? Give, in a general way, what you know about it—that is, what opportunity you have had to become familiar with it.

A. I have visited mills where this process was in operation,

and have also examined in the laboratory flour bleached by the Alsop process.

Q. About how many mills have you examined, where the Alsop bleaching process was at work?

A. Quite a number, possibly twenty mills.

Q. On such visits, did you ever ascertain whether the nitrogen peroxide gas, generated by the flaming arc, as described in the patent in evidence, here, could be seen in the generator,

or smelled in the agitator?

A. It would be a difficult matter to see it, in the mills I visited, for the reason that it was enclosed within either the generator or the agitator, and, although the generator had a glass in front, this was usually dirty, and the apparatus was in a dark place, and, opening the agitator, the particles of flour were in the air, and it was, therefore, impracticable to make an observation.

Q. That is, the flour was in a state of agitation?

A. In a state of agitation, and, even if the gas had a color, quite distinct, it would not have been possible for me to have seen it, under these conditions. The odor, however, was quite apparent, and frequently, from leaks in the agitator, or, on opening the door in the agitator, I was able to detect the nauseating odor of nitrogen peroxide.

Q. Are you familiar with the substance know as nitrogen

peroxide? A. I am.

Q. And is that substance employed in the Alsop process?

A. It is. It is the substance formed in the agitator, and, mixed with air, agitated with the flour in the agitator.

O. Describe the gas as to its properties.

A. Gas, at ordinary temperatures, is brownish in color, heavier than air, and can, therefore, be poured like liquids. It has a strong, suffocating odor. If inhaled in its pure condition, it causes coughing and serious disturbance. It has two formulae, according to the temperature, one NO2, or higher temperatures, the other N2O4 or lower temperatures. The quantities of these two forms vary in temperature between the extremes, variously, according to whether the temperature is high or low.

Q. Upon the application of this Alsop bleaching process of flour, such as was contained in this seizure, a part of which you have seen and examined, you may tell us whether or not, in your opinion, there is, by such process, any

substance added to or mixed with the flour.

Mr. Smith: Wait, your Honor, I object to that as incompetent, irrelevant, and immaterial, being the identical question—the one identical question that this jury will be called upon to determine, not a matter of expert testimony. I don't

object to him asking just what takes place, but this is the ultimate question the jury is going to pass on.

The Court: Will you read the question?

(Last question read)

The Court: You may answer.

Objections overruled, claimant excepts.

A. The nitrous and nitric acids are added to the flour.

Q. How does that come about. Tell us the scientific detail of that.

A. Nitrogen peroxide, coming in contact with the moisture,

forms these two acids, by absorption of the water.

Q. That is, the moisture content of the wheat, or of the wheat flour, you assume to have existed in this flour at the time it was milled?

A. Flour always contains somewhere from ten to fifteen per cent of moisture. There is also usually—always a certain amount of moisture in the air. So that nitrogen peroxide, coming in contact with moisture, would form these acids.

Q. Would these acids remain, as such—that is, nitrous acid, and nitric acid,—or, would there be a change, immediately, or after a while, so that they would take on other forms?

A. It is possible for these acids to combine with bases, to form respective nitrites, and nitrates, from nitrous acid and nitric acid. It is my opinion, however, that, in the flour, the nitrous and nitric acids largely remain in

the form of the free acids.

Q. Now, your analysis dicloses that you found 1.8 parts nitrogen per million, in this flour. What, in your opinion, was the source of that substance?

A. In my opinion that substance was formed from nitrogen

peroxide.

Q. At the time of the bleaching?

A. At the time of bleaching.

Q. Now, with respect to ash. You made an ash determination, .57 per cent of one per cent. What is meant by that?

A. It means that, in one hundred parts of the flour, there are fifty-seven hundredths of one per cent of mineral substance—substance which remains on burning, just as wood ashes are obtained from wood on burning. This mineral substance consists of phosphates—consists largely of phosphates of lime and potash, also contains smaller amounts of magnesia, and a little sulphur. A small amount of iron.

Q. What is the significance of ash, determined in this case?

What does that mean? What is to be drawn from it?

A. The significance is, that is shows us something as to the grade of flour.

Q. Explain how that is true-how it sheds any light upon

that question.

A. The highest grade of flour, namely, the patent, contains a relatively low percentage of ash. A straight flour contains a somewhat larger percentage, and clear flours still larger percentages. You go right on through. The red-dog contains more than the clear, and the bran, more than the red-dog.

Q. In the case of patent flours, what is the percentage of

ash?

Mr. Smith: Pardon me. I object to that as incompetent, irrelevant and immaterial, the witness not having shown that there is any standard, nor shown his competency to testify what makes a standard of patent flour, and what does not.

Mr. Butler: I will ask him this.

Q. Have you, yourself, become familiar with the term "patent flour", as that term is used in the flour trade?

A. I have.

Q. And have you, yourself, made examinations for the determination of the ash content of patent flours?

A. Yes, sir, a great many patent flours.

Q. Over what period of time? A. Some years. Q. The patent flours produced in what territory?

A. All over the country.

Q. Now, what is the ash content of patent flours, or the range of content?

Mr. Smith: We object to that as incompetent, irrelevant and immaterial, and not being shown that there is any standard by which to measure it, no proper foundation having been laid.

The Court: You may answer it. Objection overruled.

A. The patent flour should not contain forty-two or forty-three hundredths of one per cent of ash.

Q. My question was, how much-in your experience, do

they contain, naming the minimum and maximum?

A. They never contained more than forty-two or forty-three one-hundredths of one per cent, and the minimum is not so clearly defined. It varies with the skill of the miller. Might run down to .3 per cent, or even lower.

By the Court:

Q. You mean, down to thirty?

A. Yes, down to thirty hundredths.

By Mr. Butler:

2. The range should be, then, from thirty to forty what?

A. Forty-two or 'three.

Q. Will you explain to us, as a practical matter, how that comes about, that there is less ash contained in the patent flours, than there is in the whole flour content?

A. The amount of ash, or mineral matter, in the wheat kernel, diminishes from without, inward, being highest in the brans, and lowest in the middle portion, or starchy portion of the kernel. Now, it is the province of the miller to secure, in the form of white flour, as much as possible of the valuable inner portion of the grain, and to secure that as free as possible from contamination with the bran coats, and the dirt, and other substances adhering to the grain. When the milling process is performed, there is produced a patent, the amount of ash, would not exceed that stated. The lower the grade of the flour, the higher the percentage of the ash. Bran contains several per cent of ash.

Q. Now, as to the coloring matter, in the flour content of the wheat. Where is that the heaviest, if there is any difference?

A. At the outer side.

Q. Or, as you approach the middle?

The coloring matter of the grain exists in several forms. The yellow colored, or slightly orange-yellow color of the flour is associated with the fat, so, if you extract from the flour all the fat, and dry the flour, you will get a powder almost as white as starch, providing of course, the flour is a patent, to begin with. The bran coats contain coloring matter of a more insoluble-more refractory form. There is one layer of the wheat kernel-two layers, I might say,-the third, or fourth, or fifth,-two layers of the grain, which are very thin, but are nevertheless, of an intense brownish color. These two thin layers give to bran its brownish color, as distinguished from the creamy yellow color of a good patent flour. Now if the flour is so made as to introduce into it more or less of these brown coats, we would get that brownish color, in the form of minute specks of bran, more or less apparent, according to the fineness of the grinding, so, in such a flour, we would have two colors-first, the yellow, or orange-yellow color, associated

with the fat, and, second, the brownish color of bran 281 particles. In addition, there might be dirt, which would give the flour color, and there might be weed seed, such as cockel or wild buckwheat, which would be evident cause of their dark shells, or skins; but, the color of flour that is altered by bleaching, is the yellow color associated with the fat, and which is soluble in ether and in gasoline.

Q. What portions of the wheat are used for patent flour?

A. The inner portions of the kernel—the so-called floury part of the grain.

Q. Having the least ash,—the least ash, and the least yellow?

A. Having the least ash.

Q. And the least coloring matter contained in any of the layers?

A. Least coloring matter. Not always the lowest color, but the lowest coloring matter, as regards contamination, with

outer layers.

Q. Well, where is the strongest color? The oil, I understand, is yellowish. Now, is that concentrated where the patent flour is made, or is it out at the edge, where the clear is made?

A. That oil is first in the germ, but that is eliminated in manufacture. Then, there is oil in with the starch, in the floury part of the grain, and then there is more or less oil in

the bran coats.

Q. Is it distributed uniformly through the body of the wheat, or is it lowest at the center, and greater at the out-

side, or vice versa, or how is that?

A. It is a curious fact, that, although there is more oil in the germ, and more oil in the outer layers, it is not necessarily a darker colored oil. That is to say, if you were to extract the oil from the germ, and then from the inner part of the grain, it is not necessarily true that would be a deeper color of yellow than that from the floury part. There is more fat in the outer layers, and that larger per centage of fat, or oil, even if that oil were no more yellow than that inside, or, were even less yellow, would give it the strong color.

Q. What effect did the bleaching by the Alsop process have upon this flour that was seized, in your opinion,

as respects the color?

A. It lightened the color of the oil. That is to say, the coloring matter that is associated with the oil. The coloring matter and oil are not the same thing. The oil strictly speaking, is colorless, but the color, associating with it, gives it color. That coloring matter was lightened.

Q. What determination, in the analysis which you have

given us, bears upon that point?

A. The gasoline number.

Q. Explain that to the jury, as fully and as briefly as possible?

A. I will say that it is an exceedingly difficult matter of expressing the color of flour in figures. The miller "slicks up", so to speak, his flour, on a glass plate, or on a board, along-side of a flour which he calls his standard. That is to say, he smooths off a portion of the flour, on this board, and then a

portion of the standard. Then he cuts them off square, removes that in between, and brings these two flat portions of flour together, and, finally, with one stroke of his flour slicker, squares his flour spacher, which every miller owns, with which he rubs it off, so that both are smooth. He does it so carefully, that the two squares, rectangles of flour do not mix, and there is a line between them. In that way he can see whether the flour in question is darker or lighter than his standard. Now, that is merely comparative. He has got no definite measure of the flour in figures. He doesn't call it "Number 8, 10, or 15," according to the color. That is an exceedingly difficult thing to do. There is an instrument, however, whereby this can be done. It is known as the "Lovebond Tintometer". There, you spread the flour out, flat, put it in where it is lighted, and look at it through a tube. You will notice, in that case, the slightest, yellow-the color of the flour. Now in order to measure that color, on the otherside, the operator introduces little colored glasses—vellow, or red, as the case may be—until he matches the color on the one side, formed by this glass with the flour, and, then looking at his figures on the glass slides, he de-

283 termines his color. I will say that that process is exceedingly difficult, and requires a trained eye, and, furthermore, it requires a good light. In the city of Chicago, where I am obliged to work, we don't see the sun all the time. The air is filled with smoke, and we found it impracticable to Others have had the same experience; so, I have use this test. devised this method, known as the "gasoline number", to measure the vellow color of the flour. Now, the process consists in weighing out a certain quantity of the flour. It is a little over three ounces—100 grams—in a bottle, just like this (referring to bottle)-empty bottle, and then introduce a measured quantity of ordinary automobile gasoline, and shake the bottle for five minutes. On allowing the bottle to stand over night, it will be seen that the gasoline which comes up to the surface takes on a vellowish cast. Now, if the flour is unbleached, that vellow will be very decided. If, however, the flour is bleached, it will vary in color, often being entirely colorless. Now in order to get that color in tangible terms and figures, this gasoline solution is removed, filtered, to make it entirely clear, and then it is compared with colors of known flour-standard colors. I use a solution of a chemical that gives a vellow color, and I compare the sample I am analyzing, with this yellow solution, variously diluted, until the two colors match, and, in that way, I can express the gasoline number,—this color of the flour, in definite figures. For example,-if I may give illustrations?

Q. Yes.

A. Some Nebraska flour which I have examined, has a color value of 2.6, and some soft wheat flours—

Q. (Interrrupting) That is, in the case of bleached, or un-

bleached Nebraska flour?

A. Unbleached Nebraska flour. And some unbleached, soft wheat flours which I have examined, flours which are used for pastry, lacking the strength of the patents, and also sought after because they are white.—I have had figures as low as 1.4—1.2, possibly.

Q. And this? you make about two-thirds of one

point-.66?

284 A. I make this about two-thirds of one pour.

Q. Yes.

A. I should add, if it is desired to give an accurate description of this method, that, before filtering, after standing over night, the bottle is shaken once again, until the flour is all commingled with the gasoline, and before the filtering. The reason for that is, that the shaking for five minutes, the first day, doesn't remove all the yellow color, but, on standing over night, the layers of gasoline in contact with the flour take up a little more, and this final shaking is made, just to give the maximum color, before the filtration.

2. Now, you made the determination of acidity, computed

as lactic acid? A. As lactic acid.

Q. And that was about 1-10th of 1 per cent, being .113?

A. Yes.

Q. Has bleaching any effect upon acidity, determined as lactic acid?

A. Bleaching increases the acidity of flour, but it doesn't increase it in the form of lactic acid, or organic acid.

Q. It doesn't change it, when computed as organic acid?

A. When computed as organic acid, it doesn't change it. Q. Now, with respect to this particular determination that you made, of this particular flour. You have given us the opinion that the nitrous-nitregen, or nitrite reacting material, was added by the bleaching. Now, was the ash content affected by the bleaching, at all? A. No; not at all.

Q. The color is? A. The color is.

Q. And the inorganic acidity, or metallic acids, is increased?

A. The mineral acids, nitrous and nitric acids.

Q. That would be determined in your first point? Is it included in the one, indexed as nitrite, or nitrite reacting material? A. In the free nitrous and nitric acids.

Q. Now, in your study of flour bleaching, have you made any investigations to determine whether or not these nitrites, or nitrous-nitrogen, or nitrous acid, are normally in flour? That is, I mean, in flour that is not bleached,—

whether they are natural to the flour?

A. I have examined a great number of samples of flour ground from wheat in the laboratory, protected from any possible contamination with laboratory fumes. In no case have I found such a flour to contain nitrites, or nitrous acid. Something in the neighborhood of 300 such samples of flour, ground in the laboratory, representing wheat from all over the country, have been examined. The wheat was of all grades and kinds, some of it in a deteriorated condition, but, in no case, was any nitrous acid found in this flour. From this, and other experience, I am forced to the conclusion that nitrous acid and nitrites are not normal constituents of flour.

Q. Now, as to the amount of added substances or material, as the result of this gas, mixing with the flour, have you made any studies for the purpose of determining whether or not the amount of added substances bears any relation to the

amount of the nitrogen peroxide used for bleaching?

A. Yes, I have made experiments, using—bleaching, myself,—and using different quantities of nitrogen peroxide gas, and have examined and made extensive analyses of the flours so bleached, determining the amount of nitrous-nitrogen, and other constituents. The amount of nitrous acid steadily increased with the amount of bleaching gas used.

Q. That is, the amount of this added nitrous substance increases with the amount of bleaching medium employed?

A. Yes, sir.

Q. Now, with respect to the amount recoverable after bleaching by the methods you employed, to ascertain that there was 1.8 parts per million, here,—does that remain the same from the time, or does lapse of time, after bleaching, affect that?

A. It gradually disappears, on long standing. The nitrous acid goes into some other form. The evidence is, it goes into some other form, and remains in the flour, so that tests made a month after bleaching will show a somewhat lower amount of nitrous-nitrogen, or nitrites, than that obtained immediately

after bleaching, and so on. If the flour were kept long 286 enough, under certain conditions, it might disappear entirely. This does not mean, however, that the nitrite disappears before the flour gets into commerce. It is a slow process, whereby the amount diminishes a little each month.

Q. Now as to the effect of bleaching flour by this process, upon the quality of the flour. Have you made any studies in

that regard and, if so, what are your conclusions?

A. I have made extensive investigations, and found that bleaching injured the quality of the flour.

Q. In what respects?

A. Well, bleaching introduces nitrous and nitric acids into the flour, and, consequently, increases the acidity of the flour.

Q. That is, the metallic acidity? Is that what you mean, or the mineral acidity? A. The mineral acidity.

Q. The mineral?

A. Well, it increases the total acidity.

Q. Yes? Next?

A. Next, the constitution of the fat is altered, by bleaching, and, at the same time, the flavor of the fat, and the color associated with the fat, are altered, the flavor being deteriorated, and the color made lighter.

Q. Next, if any?

A. The gluten is also altered in its physical characters, and also diminished in amount, by bleaching. The bread made from bleached flour is inferior in flavor and odor, to unbleached flour.

Q. Yes? Now, have you compared the changes effected by the bleaching of flour with this nitrogen peroxide gas, as employed by the Alsop process, as it was in this case, with the changes wrought by natural aging and conditioning of the flour? A. I have.

Q. Are they the same, or different, and, if different, in

what respects?

A. They are similar, as regards the effect on the color, but they are different in several respects. The first, aging does not introduce nitrous acid; second aging improves the gluten, instead injuring its physical characters.

287 Q. Yes?

A. Aging of a sound flour improves its flavor, if the aging isn't carried too far, whereas, bleaching deteriorates the flavor.

Q. Yes?

A. Now, pardon me,—natural aging also affects the water content of the flour, as a rule.

Q. In what way-increase, or diminish it?

A. The flour after bleaching, being usually drier than the original flour, although, if it is aged in a moist climate, it may often take on more moisture, but in any case, the flour would take on a moisture content, corresponding to the moisture of the air in the region where it is aged.

Q. Now, my attention was drawn away for a minute,—natural aging, under normal conditions, increases, or dimin-

ishes the water content?

A. That depends upon the climate, whether it is wet or dry, but, ordinarily, there is a loss of moisture.

Q. After the bleaching? A. The bleaching.

Q. Yes? Now, that matter is spoken of in this patent, and the result given there is: "In the untreated flours, showed the flour constituents in the proportions named, water, 9.84"—that is, out of 100", and, after bleaching, water, 10.13, show-

ing an increase of about 30%, or something like that—3 of 1 per cent. Now, have you made any studies to ascertain whether or not the bleaching by the Alsop process, and by this nitrogen peroxide gas, and atmosphere, affects the water content, and, if so, how does it increase it, or diminish it, or leave it the same?

A. I have examined flour, bleached and unbleached, and have been unable to find any material change in the moisture content, the same flour being examined in both cases.

O. And different degrees of bleaching applied?

A. Yes, bleaching to different extents.

Q. Yes, that's what I mean—more peroxide of nitrogen used, beginning with a little, and going on up to a large quantity?

A. I found no difference—no appreciable difference in the moisture content, in flours bleached in the laboratory, using peroxide, and also in flours collected from mills—no greater difference than what could be ascribed

to the unavoidable errors of experiment and analysis.

Q. You spoke of its effect upon gluten, I think,—the bleaching—as diminishing it. Natural aging,—does that have any effect upon the quantity of the gluten?

A. It does, as a rule.

Q. The natural aging acts upon the quantity of the gluten? I am speaking, first, of the quantity.

A. Pardon me. The bleaching affects the percentage of gluten.

O. You said it had an effect? A. It does.

Q. Slightly diminishing, as I noted it. Now, what is the

truth with respect to natural aging?

A. Natural aging might, also, produce a lower amount of the gluten, especially if the flour were aged in improper conditions.

Q. Well, is there any rule about it? You say it might.

A. I think the tendency is in that direction, in natural aging.

Q. Yes?

A. But there is this difference, that the gluten improves in its physical characters, on aging, whereas, on bleaching, it deteriorates.

Q. Yes?

The Court: I think, Mr. Butler, we will take the usual midsession recess—a five minute recess.

(Recess taken as ordered.)

The Court: Call the jury, Mr. Bailiff.

(Jury called to their seats in the jury box.)

The Court: The witness may resume the witness chair, please,—Doctor Winton.

Andrew L. Winton, resuming the witness chair, was examined and testified further as follows:

289 By Mr. Butler:

Q. Now, Doctor Winton, is there any difference, at all, as respects the effect upon flour, between the bleaching by the Alsop process, and bleaching in the laboratory, by means of this nitrogen peroxide gas and atmospheric air?

A. No, sir; provided the same amount of nitrogen peroxide

is used.

Q. Well, that is what I meant—with a like degree of bleaching. Now, as to the effect upon the appearance of the flour—I mean, of one kind of flour,—we will say flour from a new wheat,—as compared with flour made from that same wheat, if you will, having been aged and [condition], and new flour; whether made from new wheat or old wheat, as compared with old flour; patent flour as compared with straight, and so on—what effect does the bleaching by the Alsop process, such as was practiced upon this flour that has been seized, have, in those respects?

A. Bleaching makes a new flour or a flour from new wheat, which is naturally more yellow than an older flour, appear lighter, and, in that respect, causes, the flour to simulate or appear to be older, or, from older wheat; in other words, it

leads the purchaser of the flour to believe-

Mr. Scarritt: Wait a minute; if your Honor please, I object to that.

By Mr. Butler:

Q. Just give the appearance.

Mr. Butler: I didn't intend to call for that, of course, Judge, because the purchaser,—

Mr. Scarritt: Might have a different idea.

Mr. Butler: Yes—be wise to it,—and he might not. Can't tell anything about it.

Q. Now, as respects,—take, for example, the situation as would be illustrated by the testimony of Mr. Tucker, here,—the bleaching of a straight flour, or, as he called it, a "cut straight" flour, being 40 per cent of the flour content, after the 60 per cent patent was taken out, what would be

the 60 per cent patent was taken out, what would be the effect upon bleaching that straight, as compared with

the appearance of a patent flour?

By Mr. Scarritt: What do you mean? You mean the effect in appearance?

Mr. Butler: Yes, purely in appearance, now.

Mr. Scarritt: You are not calling for a conclusion?

Mr. Butler: No,-purely in appearance.

A. It would make it lighter in color.

Q. Well, I know, but as compared—more like the patent flour, or more unlike that,—is what I am trying to get at.

A. It would make it resemble the patent, in color.

Q. Now, respecting the quality of flour which is fresh, newly milled; How does that compare with the quality of the same flour if aged? A. It improves, on aging.

Q. Yes? Then, it is inferior when it is fresh, is it?

A. It is inferior when fresh.

Q. Does the color change, when aging, too?A. The color changes very slowly, on aging.

Q. In what way does it change? A. It becomes lighter.

Q. It becomes lighter? Now, in respect to change of color wrought by time, as compared with change of color wrought by the Alsop bleaching process, have you made any comparisons, so you can give us any light upon that subject?

A. I have made an extensive series of experiments, bearing upon that point. These experiments are not yet finished, but they have been conducted for ten weeks. I obtained, through our regular, official inspectors, samples of patent and clear flours, each from the same milling, and representing the products of 15 mills in different sections of the country, using wheat from different sections of the country. These flours were bleached. Half of each sample was bleached, and the other half was left in its original condition.

Mr. Scarritt: You mean in the laboratory, Doctor?

A. In the laboratory.

By Mr. Butler:

Q. That is to say,—let's see that we all understand it. Your inspectors were directed to go out into the country, and did go out, so far as you know, and send you some flour, some patent, unbleached, and some clear, unbleached? Is that right? A. Yes, sir.

Q. And then you divided the samples?A. Divided in each case the same.

Q. One you bleached in the laboratory, and the other you ordered to remain and age, naturally? Is that it?

A. That is it. In other words-

Q. (Interrupting) And then you compared the color of the flour of each, from time to time? Is that it?

A. That is it.

- Q. Now, give us the result.
- A. Now, perhaps, to make it clearer, the products of 15 mills were examined; that made 30,—one of patent and one of clear, from each mill; each of these was bleached, in part—half of each was bleached, so, that doubled, again, to four samples, making 60, in all. The quantity of gas employed was 20 cubic centimeters per kilogram of flour. It happened,—it was by chance,—that the amount of nitrites thus introduced, was practically the same as in this particular flour seized.

Q. In this case?

A. In this case. I will say that the average amount of nitrous acid, in the new flour examined the day after bleaching, was 2.19 parts per million, whereas, in this seizure, it was 1.8, but the seizure sample was not examined until some days after the bleaching; furthermore, the amount introduced in these flours was not always the same. The figure I just gave, that I gave for an average of the flour bleached in the laboratory, was for the patent flour. The clear was an average amount of 2.08,—somewhat less. The color of the flour—the "gasoline number", as we call it—was determined, of all of this, when fresh; then, again, 5 weeks after; again, 10 weeks after, and we hope to continue the experiment.

Q. Yes?

A. Giving only averages, the loss in gasoline number, during 10 weeks, was .44; the loss of bleaching, giving only the average—and these are for the patents—was .55. In other words the average loss on bleaching patents, as determined after ten weeks,—the average loss on bleaching 15 patents, making the test the next day, was .55, whereas the—if I may be allowed to repeat—the average gasoline number of the bleached flour examined, was, after bleaching—the day after bleaching,—.55, whereas the average gasoline number of the unbleached flour, after aging for ten weeks, was 1.58—in other words, about three times that of the flour bleached. The loss in color, on bleaching, standing over night, was three times, as great as on aging for ten weeks.

Q. That is, the patent, or the-

A. (Interrupting) That is the patent flours.

Q. Now, the other.

A. The clear flour, unbleached, had a gasoline number of 2.10, fresh.

Q. That is the average?

A. The average, and of 1.75, after aging 10 weeks; total amount of loss, .35. The bleached flour, examined the day

after bleaching, had a gasoline number of .61. Here again, the loss on bleaching, examined the day after bleaching, was approximately three times; the color value of the unbleached flour, after aging 10 weeks, was three times as great as that of the bleached flour, the day after bleaching.

Q. Now, as to the color value of the patent, unbleached, as soon as you got it. After ten weeks, it was 1.58. What was

it, before? A. 2.01, fresh—2.02.

Mr. Elliott: Is that the clear, or the patent?

The Witness: That was the patent.

By Mr. Butler.

Q. And the sample to be contrasted with that, is the 2.10?

A. 2.10?

Q. Unbleached?

293 A. They are a little confused. I was a little confused in my statement. Perhaps I can give it to you again.

Q. Yes; have them on the same basis, so we can contrast one with the other, immediately.

Mr. Butler: (To Mr. Elliott) That was your idea?

Mr. Elliott: Yes.

By Mr. Butler:

Q. Clear flours, before you start in with the patent.

A. First, the patent, gasoline number, fresh, average, 2.02.

Q. Clear, the same? A. 2.10.

Q. 2.10?

A. 2.10. Patent, aged 10 weeks, color value, 1.58. Clear, aged 10 weeks, 1.75. Loss, in the case of the patent, .44. Loss, in the case of the clear, .35.

Q. Now, the bleaching? A. Gasoline number-

Q. (Interrupting) Patent?

A. (Continuing) Of the patent, fresh .55. Gasoline number of the clear, fresh, .61.

Q. Did you test that, with the lapse of time? A. I did.

Q. What did you find?

A. The gasoline number of the patent, bleached, after 10 weeks, was .34, and of the clear after 10 bleaching was, .45, a loss in the first place of .21, and, in the second place of .16.

Q. Now, you didn't give us the five-week period, and I will

ask you that, simply to keep it in order.

A. Approximately. That was approximately, after that time.

Q. Now, these figures you have given us, were the variations of strength. Can you give us the minimum color, for that time, and the maximum color value, of the 15 samples?

A. I can. For the three periods,-fresh, and the-

Q. (Interrupting) Yes, give us the spread for the three.

A. I didn't give you the figure for five weeks.

Q. Now, but give us just the spread, at the beginning, [at] at the 10 weeks. That will be enough for my purposes, I think.

A. Unbleached patent, the maximum, 2.63.
Q. Minimum? A. The minimum, 1.43.

294 Q. Clear.

A. Maximum, 2.63. Minimum, 1.60. Aged 10 weeks, maximum,—for the patent?

Q. Yes, A. 2.08. Minimum, 1.22.

Q. Yes.

A. Clear, maximum, aged 10 weeks, 2.17; minimum, 1.33.

Q. Have you made any determinations or studies to find out whether or not this nitrite reacting material, by whatever name it is properly called, remains in bread made from the flour, so as to give us your opinion as to whether it would remain in the bread made from this flour, here?

A. I have made an extensive series of experiments, touching

this point.

Q. And in connection with the same, did you make any test or observation alone, or with others, as respects the other qualities of the bread—like odor, and flavor—the aroma and

flavor, whatever it may be.

I did. In one set of experiments I only determined the flavor, and in a more recent so of experiments, I attemted to separate the flavor from the odor; in other words, in the latter case, not only chewed the bread, and got its taste, but also smelled the bread, and got its odor. Now, all these experiments were performed without seeing the bread. If one saw the bread they could readily tell whether it was bleached, or which was which of the two, being the same flour, bleached and unbleached, from its color, and, therefore, it would not be a fair test; and so pains was taken, always, to have the person who did this testing either in a dark room or blindfolded, or fixed some other way so that they could not gain any impression from the appearance of the bread. Now, the first series of experiments was performed with flour bleached in the laboratory, with different quantities of nitrogen peroxide. tities varied from 5 cubic centimeters to 500 cubic centimeters of gas to 7 kilograms of flour. The tests were made a week after the bleaching, and also five weeks after the bleaching. will say that the amount of nitrous nitrogen introduced, for 5 cubic centimeters, was .6 of a part, per million; for 10, was 1.20 parts; for 25, 3.40; and so on. The flour seized in this

case contained 1.80, and therefore it may be stated that the bleaching was practically the same as would be obtained with 15 to 20 cubic centimeters of the gas. The bread in

each case,—the flour in each case was baked into bread, and by two methods. One method used was the so-called Koellner method, which has been employed in a good many mills and bakeries. It is not the method that is used in some sections of the country, but is, nevertheless, a useful one, it was thought, however, that this method might not—

Mr. Scarritt: (Interrupting) We object to that, if your Honor please.

Mr. Smith: This dissertation.

Mr. Scarritt: He is stating conclusions. Now, let him state a few facts. We object to him stating these conclusions, and arguments.

Mr. Butler: This was merely with respect to a detail—the preferability of one detail as against another, the reason for selecting the detail of experiment.

Mr. Scarritt: I am not objecting to the question, but the rambling statement he is making, with reference to these conclusions and arguments that he is interjecting into the case, which are absolutely immaterial, and an invasion of the province of the jury. He is attempting to decide the very questions that are to be submitted to the jury.

The Court: I don't know what the jury knows. He is describing the two methods of baking. I don't know what it is. Maybe the jury knows all about it.

Mr. Scarritt: He had left the description of the baking, and was telling what was thought. That is what I am objecting to.

The Court: I think we will go on.

Mr. Scarritt: As long as he was describing the process, I didn't object.

296 The Court: He was talking about the Koellner method of baking, as I understood him. I don't know what it is.

The Witness: (Continuing) The Koellner method is a straight dough method, whereby the bread rises but once. In most households, it is customary, as I understand it, and also in many bakery establishments, to raise the bread several times. It was thought that the Koellner method might not give the bleaching process a fair show, in that it might not eliminate as much of the nitrites as would a method more nearly like what was used in the household, and in the bakery, and so we devised another method, which can lay little claim to

originality, as it was merely the purpose to bake the bread, make a loaf of bread as nearly like what was made in the household, as possible,—to make a loaf of bread that would be acceptable to any of us at a meal. This was called the "domestic" method, and differed from the other, in that the bread was allowed to rise twice or three times. These methods were followed, side by side, in each case. Three judges were used to determine their opinion as to the flavor of the bread, always without seeing the—

Mr. Scarritt: (Interrupting) Now, we object to that.

The Court: Yes, I think—That objection is sustained,—what three judges said. We ruled one judge out, yesterday, and now I am going to rule out those three judges.

Mr. Butler: I have forgotten about the one.

The Court: He was about saying, as I understood-

Mr. Butler: (Interrupting) Well, very well. I am not now asking what they said. I want it so the record may show, my theory and idea of this matter is, it is proper to show what they did.

The Court: Yes.

Mr. Scarritt: Yes.

Mr. Butler: Now, I am not asking, now, for the conclusions, at all. As, for example,—I think there will be no harm to state it, so the Court may see just what my point 297 is,—for example, they made bread in the laboratory.

The Court: Yes,-how they did so.

Mr. Butler: Then, three individuals, at different times, who are known not to have seen the bread—

Mr. Scarritt: (Interrupting) Now,-

Mr. Butler: Now, just wait a moment, Judge Scarritt.

Judge Scarritt: All right, now. I don't want you to testify.

Mr. Butler: I am not going to say what they said. (Continuing) Taste the bread, and they say something about it, as to their findings or determinations, which indicates their opinion; what it is, I don't know.

Mr. Scarritt: Do you claim that that is evidence in this case?

Mr. Butler: Well, wait a moment. The record is made of that. This is done, from time to time, as I understand it, and the conclusions of these gentlemen, as—

The Court: (Interrupting) Will those gentlemen be here, on the witness stand?

Mr. Butler: No, I think not. I am going to be perfectly candid.

The Court: It will not be allowed this witness to state what they found, or what they said.

Mr. Butler: Only what they did.

The Court: Oh, yes,—what they did, I suppose, under his guidance, and under his eye. The chemist must have assistants.

Mr. Scarritt: What sense is there in saying they tasted the bread, when there is no conclusion to be derived from it, according to the statement of the gentleman on the other side.

Mr. Butler: Suppose the question was, your Honor, as to color tests, or anything else,—

The Court: I can't hear you, Mr. Butler.

298 Mr. Butler: I say, it seems to me that, with respect to an inquiry of this sort, conducted in a broad way, it does seem to me that the conclusions are admissible. Indeed, almost all the conclusions arrived at, as a result of chemical experimentation, for example, are arrived at by that method.

Mr. Scarritt: This is an expert witness, and you propose to put him on, to tell what other experts did?

The Court: Let us proceed.

By Mr. Butler:

Q. Who were the judges? Maybe we can get them. I don't know.

A. The judges were three chemists in the laboratory. One of them is here in the court room; the other two are in the East. One is in New York, the other is in Buffalo.

Q. Oh, yes. Well, how was it done? Now, don't state the conclusions until we find out whether or not that is proper.

A. These people were asked each day, to taste all the bread, and give their opinion as to which was the superior—the bleached bread, or the unbleached—bread made from the unbleached flour.

Mr. Scarritt: We object to that, and ask to have it stricken out, if your Honor, please,—absolutely immaterial, and hearsay testimony.

The Court: I don't see that it is material, one way or the other.

Mr. Butler: I think it ought to remain in, as preliminary, now.

The Court: Oh, yes; I think so, as to what they did.

By Mr. Butler:

Q. Was there any record kept as to the expression of opinion?

A. A careful record was kept of their opinion.

- Q. Now, did you, yourself, with respect to this bread test, take part?
- A. In that first series, I started to take part, but was obliged to give it up. More recently, in a more extensive series of experiments, I, myself, took part in every tasting, and the other judge—there were only two in this latter case—is in the court room.

Q. That is, Miss Wessling? A. Miss Wessling.

Q. These two series were conducted in the same way as the other, except different judges? Was that it?

A. Different judges.

The Court: Yourself, and this lady.

The Witness: Yes, sir; that is true, Judge.

By Mr. Butler:

Q. Now, give us the series. You had bleached flour, and unbleached flour, and different degrees of bleaching, did you?

A. Only one degree of bleaching.
Only one degree of bleaching?

A. And that degree of bleaching was practically the same as that stated in this seizure.

Mr. Scarritt: Now, we object to his stating that conclusion. Let him tell how he mixed it, and how it is bleached, and the jury can determine whether it is the same, or not.

Mr. Butler: I just asked him, how did the degree of bleaching, used in the bleaching of the flour in the laboratory, compare with the other examination of the bleaching of this flour.

Mr. Scarritt: That is asking for a conclusion,

The Court: Judge Scarritt, let me understand you. You object to this witness stating his conclusion?

Mr. Scarritt: His conclusion, and the other experts' conclusions,

The Court: I sustain you, on that, and overrule you, as to what this witness, himself, found.

Mr. Scarritt: All right. I am not objecting to that.

The Court: Yes, you were, Judge. I so understood you.

Mr. Butler: You misunderstood the witness, Judge Scarritt.

300 The Court: (To witness) You are not to state what these three persons reported, or what this lady reported.

Mr. Scarritt: No, he was stating the conclusion that this experiment was the same as some other experiment when the law requires that he shall state what each experiment was, and let the jury determine whether it was the same.

The Court: Well, that's the long road, but we get back to the same Robin Hood's barn; but go ahead.

Mr. Scarritt: I don't know where Robin Hood's barn is!

The Court: All right.

#### By Mr. Butler:

Q. Go on, and describe this second series, and your own conclusions as to what you tasted and smelled, and determined?

A. I have already described the flour used, as being 15 patents and the corresponding 15 clears from as many mills, in different sections of the country, and representing a variety of flours. The average percentage of nitrous-nitrogen in the patent flours, fresh—not the average percentage, but the average parts of nitrous-nitrogen, per million, in the fresh flour, patent, was 2.19; aged ten weeks, 1.73. The average parts per million of nitrous-nitrogen, in the new flour, clear, was, 2.08; aged 5 weeks, was 1.83. I should have given the amount of nitrous-nitrogen in the patent flour, aged five weeks, which was 1.91. The tests were made on the new flour, and after aging five weeks. We made no tests after aging ten weeks, because that came only a few days before this trial.

Q. Now, how was the bread made, by the two methods you referred to, in the former series of experiments—the Koellner

method, and the domestic method, as you described it.

A. As our former experiments had shown the results obtained by the Koellner method, for the points in question, were practically the same as for the domestic method, only the Koellner method was used, in this series.

Q. Now, what were your conclusions? Now, what did you do? Just tasted it and smelled it-each sample?

Tasted and smelled each sample.

Q. And that without seeing it, and without any knowledge of the circumstances as to whether it was bleached or unbleached flour?

A. Without seeing, always tasting or smelling the bleached and the unbleached, corresponding, side by side. It was merely a comparative test, to see whether the bleaching made the flour inferior or superior, as regards flavor.

Q. Well, now, what did you decide, in each instance?

A. First, I will give the results-my opinions upon the flavor of the bread.

Mr. Scarritt: From your personal experiments.

The Witness: My personal experiments.

By Mr. Butler: Yes. I called for that, Judge, only.

A. Of the 15 flours, patent, examined, in every case I found the bread from the fresh flour superior to that made from the bleached flour.

Mr. Scarritt: I object to that, if Your Honor please,mere conclusion of the witness.

By Mr. Butler:

Q. Well, I asked what was your opinion, as respects taste and odor?

Mr. Scarritt: I object to that question, and ask that the answer be stricken out. It is for the jury to decide whether it was superior or inferior, and for him to state the fact, as to what taste it had, if he can.

Mr. Smith: Nothing in the law about flavor that I know of.

Mr. Scarritt: And for the further reason that it is immaterial what the flavor was.

Mr. Butler: Now, the statute says food is adulterated, that has anything mixed or packed with it, so as to impair or injuriously affect its quality or strength. It is in the 302 disjunctive. Now, I believe that bread's qualities involves the idea of the flavor of the bread, and the aroma of the bread. Now, that being so, it is proper to show the effect upon flavor and aroma, of bread, of the bleaching of the flour that makes the bread, by means of this Alsop process, in a manner comparable with the manner in which this particular flour was bleached. Now the evidence shows that the bleaching was the same method, and, substantially, on the average, the same degree of bleaching. It shows the method by which the bread was made, and here is a man who is experienced, now, upon parallels, with the bleached and the unbleached flour, and we ask him his opinion, in each instance, as to which was superior, or better in flavor and aroma, separating as to each, if need be. Now, that is the precise situation presented, and the precise information which we offer, and it seems to me that it is exactly on the same footing as would be the testimony of any person who had tasted an apple before it had been cooked, and any apple after it was cooked, as to whether the taste was better before cooking, or afterward.

Mr. Scarritt: You may taste an apple and an orange and say that the apple was very much better than the orange—superior to the orange.

Mr. Butler: Certainly.

Mr. Scarritt: That is a matter with your taste. I might taste it, and say the orange was better, but this is different. I am asking for the ruling of the court on the question, here—not on what Brother Butler is making the speech about. This gentleman pretends to say he tasted two loaves of bread, and that one was superior to the other. Now, that is a question for the jury to decide. He can tell the jury how it tasted, to

him, so far as he is concerned—not whether it suffered in quality or quantity, or anything else, but how did Then the jury decides whether one is superior to the other. It isn't for him to tell the jury, because that is deciding the case. That is deciding that proposition, and, under the rules of evidence, that is not for this witness to determine. It is for him to tell the facts as to how,-if he can-one piece of bread tasted, and how the other tasted, and for the jury to determine whether one was superior to the other, if they can determine it from that kind of testimony; but he surely can't come in and tell this jury, from the witness stand, that one was superior to the other, because, that is the very point that your Honor is determining, and that you will submit to this jury, and, if they believe this witness's conclusion, they will have to find one way-whatever way he says. We all know that a witness can't invade the province of the jury, by telling them which way to decide the case, or telling them his opinion upon questions that they are to decide. There is no trouble about that.

The Court: Suppose this contest was over a Jonathon apple—two apples, one raised in Arkansas, and the other in Michigan. They look alike. The apples have been eaten. How are you going to get at it, Judge.

Mr. Scarritt: Why, if you put an expert on the stand in the tasting business, as your Honor was talking about the smelling business, yesterday, and he tastes both apples, or two similar apples, he may be able to say that one tastes sour, and one tasted sweet, and it is for them to determine whether a sour apple is superior to the sweet, or the sweet apple superior to the sour. It is not for him to say that one is superior to the other.

The Court: Suppose now, one of the Johnathon apples is sweet, and the other sour? What are you going to do?

Judge Scarritt: Then he can say they both tasted alike.

304 Mr. Butler: Suppose they don't taste alike.

Mr. Scarritt: He may say one tasted less sour than the other, or more sour than the other. One tasted sour, and the other less sour, but he can't say, when that is the point in issue, that one was superior to the other, if that is the question the jury is to decide, because that is invading the province of the jury.

The Court: Well, I had that very question up, here, and of course I am not quoting my own rulings, as authority. I had that very question up, in this very court room, with reference to Arkansas and Michigan Johnathon apples.

Mr. Smith: We are determining misbranding.

The Court: And I can see no other way to get at it.

Mr. Scarritt: Than to let a witness say, when the jury is to determine that? Your Honor certainly didn't say that.

The Court: I certainly did, and I think I am right.

Mr. Scarritt: But I think I can show your Honor that, under the rules of evidence, you are wrong on that.

The Court: That was one of the tests applied to the apples.

Mr. Scarritt: Yes, you can apply tests, and submit those tests to the jury, but for an expert witness to get on the stand and decide, in answer to a question—a very pivotal question that the jury is to decide, is in my opinion, contrary to the rules of evidence.

Mr. Butler: May I ask a question upon that, Judge Scarritt?

Mr. Scarritt: Certainly.

Mr. Butler: Suppose, in a homicide case, the question was the cause of death, whether by shooting or by poison. May not an expert who has shown himself familiar with the surrounding facts, be asked what was the cause of death, in his opinion? Mr. Scarritt: No, sir; he cannot. Not under our rules.

Mr. Butler: That isn't so in our jurisdiction, because 305 I have known too many of those.

Mr. Scarritt: Not under our rules, or the rules of this-

The Court: (Interrupting) What rules are you talking about? I don't know.

Mr. Scarritt: I am talking about the rules of expert testimony, which provides that an expert witness cannot state, as a conclusion, in answer to a question, the very fact that the jury is to decide.

The Court: Well, let's let this go until tomorrow, and we will see. Pass this subject-matter by until the morning, but I did hold, maybe wrongly, with reference to apples. You can't tell, and no man living can tell how a Johnathon apple tastes. You can say it is agreeably, or offensively to the taste.

Mr. Scarritt: Then why did you let the witness decide the issue of the case?

The Court: Because the very question was with reference to Arkansas apples, and the apples in Michigan.

Mr. Scarritt: As to what they should be called?

The Court: No. They were called Johnathons.

Mr. Scarritt: Or as to what they contained—their contents? You Honor must have had some—

The Court: (Interrupting) Oh, that's another thing.

Mr. Scarritt: Yes, I think if Your Honor lets this go until tomorrow, I can show you a couple of decisions that will settle it.

The Court: All right. We will let it go till morning. Of course, I would be very glad, at any time, to have counsel furnish authorities on these matters. They are very interesting, and some of them are, to me, somewhat new. I tried the apple case here in this court room. Of course, I don't care to make any comparisons or suggestions on what I did.

but there is a difference between an Arkansas and a Michigan apple.

Mr. Scarritt: Yes, and there is a difference between a Minnesota apple and a Nebraska apple, too.

The Court: Yes, but-You are getting at the cost.

Mr. Scarritt: I would like to ask your Honor if the decision has been reported?

The Court: I don't know whether it has or not.

Mr. Scarritt: In the court of appeals.

The Court: No. It wouldn't be proper to talk about that case, and the results. That wouldn't be proper, here, but that was the question for determination.

Mr. Smith: Whether or not they had misbranded their apples?

The Court: Well, they can't brand an Arkansas apple or a Michigan apple, at all.

Mr. Smith: I didn't suppose anybody could.

The Court: Oh, yes,—lawyers stood up here and talked a good deal about it. A good deal of oratory on that question, and in this room. A good deal of it.

Mr. Smith: Now, this question of flavor-

The Court: Well, let it go until morning.

Mr. Smith: Allright.

Mr. Butler: I will just ask the witness a question, which might make one step in progress.

Q. Comparing the taste of bread made from the same flour,—say that one was bleached flour, and the other was unbleached flour, as you have detailed, in your experiment, which you tasted bread made from each, as to which you were testing at that particular time,—you may state whether or not the taste was the same or different?

The Court: You may answer that. Let it go until morning, after that question.

By Mr. Butler:

Q. Do you know my meaning, now? I am not asking you, now, to characterize the taste, but the two,—the unbleached flour bread, and the bleached flour bread, made under the conditions you have detailed,—I will ask you, whether or not, according to your senses, the taste of the bleached flour bread was the same as the taste of the unbleached flour bread, or whether it was different?

Mr. Helm: Mr. Butler, as I understand the witness, he says that he didn't know whether he was tasting bleached or unbleached flour; that he made these tests when he was blindfolded, or in a dark room, and didn't know. Now how could he make any comparison, if he didn't know?

Mr. Butler: Well, they had some way of getting that on record.

Q. You recorded the result? A. Yes,—the result.

Q. So that, afterwards, upon looking at the record, you could then refer back to the one you tasted?

Mr. Helm: He could keep the taste in his mouth until after that time? Is that it?

The Witness: If I may be allowed to state,-

The Court: Oh, just state if there was any difference and then pass it until morning. Was it the same, or different?

The Witness: It was different.

The Court: Let us let that go until tomorrow. Mr. Lyons, will you get the three volumes of Wigmore, so I can get at my room, tonight.

Mr. Lyons: Yes, sir.

Mr. Butler: I think that is all for the present.

The Court: You may recall him in the morning. You may cross-examine him on this, now, Mr. Smith.

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## Cross-Examination

By Mr. Smith:

Q. I don't remember whether you stated you were a graduated physician, or not? Are you? A. Pardon me?

Q. Read the question.

(Last question read)

A. I am not.

Q. But you are a graduated chemist? A. Chemist,

Q. And I believe you qualified as a food chemist,

A. Agricultural food chemist.

Q. What is included within the term "agricultural food chemist"?

A. The examination of agricultural products, and products used in farming—fertilizers, and insecticides, and cattle foods, and dairy products, and those things.

Q. I see. Have you spent most of your time in investigating foods for animals, or foods for man?

A. Pretty well divided, between both.

Q. I see.

A. More, probably, in investigating foods for man in the last fifteen years.

Q. Has that been confined to vegetables?

A. Oh, it has been confined to all classes of foods.

Q. That man eats? A. That man eats.

Q. That would mean, vegetables, fruits, and meats?

A. Vegetables are not examined so often, by the agricultural chemist, except you include potatoes, and such products.

Q. Well, during your experience, and during the time you have been connected with the government service, have you made examination of vegetable food products, to determine their value as such,—as food products?

A. I don't know as I quite understand.

Q. During the time that you have been in the service of the government, have you made examination of different food products, for the purpose of determining their value, as food products?

A. That would be, as a rule, incidental. More generally, the examination was to determine their purity and freedom

from adulteration.

Q. All right. All right.

A. But, incidentally, that would come in, because-

Q. (Interrupting) Well, in such an examination, to determine their purity, you have examined to see whether or not any foreign substances had been introduced into them?

A. Yes, sir.

O. And did that investigation include vegetables?

A. To some extent—mushrooms, and so forth. More generally the preserved vegetables.

Q. Well, did it include vegetables, just simply in a green,

or in a prepared state? A. In a prepared state.

Q. Now, you have investigated the different cereals, to determine their value as a food product? A. Yes.

Q. And that included cereals that are in a prepared state? A. Yes. Cereal breakfast foods, and such products, yes, sir.

Q. Yes. And you have examined meats, have you, to determine their purity, and their value as a food product.

A. Not domestic meats.

Q. Well, what other kinds of meats do you have, but domestic? A. Imported meats.

Q. Oh, you have examined imported meats, have you?

A. To some extent.

Q. Have you ever examined any of the products of the packing houses, to determine their purity, from the food standpoint? A. Not the Chicago packing houses.

Q. Have you, in Kansas City?

A. Not during my connection with the government.

Q. Well, did you, before your connection with the government? A. To some extent.

Q. What I mean, Professor, is, have you made an examination of meats—pork, beef, veal, and mutton,—as it is before it is cured, and after it is cured, as it is when it is freshly killed, and as it is when we get it served to us on our tables, to determine its purity?

A. I made no such comparison, but I have done some work on it, during the Spanish War, concerning canned meat.

Q. Now, did you receive this sack of flour, that was sent you? Did you receive it from the express company, personally? A. Yes, sir.

Q. Open it personally? A. Yes, sir.

Q. Now, in order to make that test, for the purpose of determining the amount of nitrogen peroxide that was contained in it, or the amount of nitrites that had been imparted to it by the bleaching, where did you get your sample—right from the top? A. I mixed it all up.

Q. You emptied the sack, did you?

A. Emptied it on a large piece of paper, and, by means of raising one corner after the other, mixed the whole.

Q. You had two sacks sent you, there, to Chicago?

A. Two sacks.

Q. Did you examine both of them? A. No, sir.

Q. You forwarded one at once to Washington, immediately? A. Soon afterwards.

Q. You made no examination of that? Now, I understand that in your examination of this, you found that there was 1.8 parts per million of nitrite-nitrogen, to a million parts of flour. Is that right? A. That is true.

Q. Now, you mean, in volume, or weight? A. In weight.

Q. In weight? A. That would be in weight.

- Q. In other words, if you could have got the nitrogen peroxide separated from a million pounds of flour, and put it on the apothecary's scales, there would have been 1.8 pounds of the nitrogen peroxide, to a million pounds of flour?
  - A. No, sir.
  - Q. How is it?
  - There wouldn't be any nitrogen peroxide there, that I know of.
- 311 Q. Well, let us learn about that. Did you find any nitrogen peroxide in this flour?
  - A. I didn't examine it for nitrogen peroxide.
- Q. Well, you were examining it to find what the bleaching process had done, didn't you? A. Yes, sir.
  - Q. Well, did you find any nitrogen peroxide there?
  - A. I didn't examine for that. I didn't find any.
  - Mr. Scarritt: State whether he found any.

By Mr. Smith:

Q. You were examining this, to find what had been imparted to it by the bleaching process, weren't you?

A. Yes, sir.

Q. Now, tell the jury whether or not you found any nitrogen peroxide in it.

A. I didn't find any nitrogen peroxide.

Q. What did you find? A. I found nitrous acid. O. Is nitrous acid a gas, or a mineral, or a liquid?

A. Well, nitrous acid, as such, hasn't been isolated, pure.

It exists with air,

Q. Well now, you chemists understand what that means, but the rest of us don't, and when you say that that hasn't been isolated that doesn't convey anything to me. I don't know whether it does to this jury, or not, but is it a gas—nitrous acid,—or, is it a liquid, or is it a mineral?

A. Well, it has not been isolated, and I couldn't say exactly what it was. It might be a gas, or it might be a liquid. It

would depend upon the temperature.

Q. Well, you found 1.8 pounds part, of this something, to

the million, did you?

A. Calculated as nitrogen, and the million of flour. If you calculate it as nitrous acid, it would be nearly four times as much—it would be about eight parts per million.

Q. But, figured as an acid? A. Figured just as nitrogen? Q. All right, let us call it nitrogen, and you found 1.8

Q. All right, let us call it nitrogen, and you found 1, parts of nitrogen, to a million parts of flour. Is that right?

A. That is right.

312 Q. That is, in weight? A. That is in weight.

Q. In other words, if the nitrogen could have been separated from the flour and weighed, the weight of the nitrogen would have been 1.8 parts, or one and eight-tenths pounds of that to a million parts of flour. Is that right?

A. That is the point.

Q. Well, now, this nitrogen that you found there, in such quantity, that there was 1.8 parts of that, to one million parts of flour,—is that a liquid, or is it a gas, or is it a powder?

A. The nitrogen is a gas but it doesn't exist as nitrogen, in

the flour.

Q. Well, that which you found in the flour. Now, that's what I am concerned in, was that which you found in the flour—did you find it in the form of a liquid.

A. I couldn't determine that.

Q. Did you find it in the form of powder.

A. I couldn't state what form it was,

Q. Did you find it as a part of the gas—in the form of a gas?

A. I made no attempt to find out whether it was a solid, or gaseous—a solid or a liquid substance.

2. Well, you were testing this flour, to determine what had

been imparted to it, weren't you? A. Yes, sir.

Q. And yet, you can't tell this jury whether or not that thing which you found was a gas, a liquid, or a powder, can you? A. No, sir.

Q. Can't tell it? But you know you found it there?

A. No question, whatever, that I found it.

Q. Now, these figures, you know, are sort of—need, I think, a little reduction. In a million pounds of flour, if we can conceive of that much flour, there would have been 1.8 pounds of this something which you found, but yet, you can't tell whether that is a gas, or liquid, or powder? Is that right?

A. That doesn't express it accurately.

313 Q. Well, aren't those the figures you gave me?

A. That is the method of expressing what was present in the flour.

Q. Yes. A. If I may be allowed to explain-

Q. (Interrupting) No, you will take too long. Answer my questions, and we will get through here. You testified, didn't you, that, in a million pounds of flour, there would be 1.8 pounds of this— A. (Interrupting) Nitrous nitrogen?

Q. Nitrous nitrogen? A. Yes.

Q. It has now become nitrous nitrogen, has it?

A. That is merely another means of expressing the same thing.

Q. All right. Now, let us get that a little reduced. In a fifty-pound sack of flour, how much would there have been?

A. In a fifty-pound sack of flour?

Q. Yes.

A. I will have to calculate that, to-

Q. (Interrupting) I wish you would, please. I never saw a million pounds of flour, and I can't comprehend it.

A. It is a matter of simple arithmetic, of course.

Q. All right. I want you to do a little deduction, here for us. A. May I have a piece of paper?

(Paper handed to witness as requested)

Mr. Lyons: This will be big enough to put the figures on, I guess?

Mr. Smith: I guess so.

A. (Continuing) You don't care for it accurately—just approximately?

Q. Oh, as nearly as you can get it—I don't care for your decimals carried out too far, but I want you to tell the jury, as

nearly as you can, how much of that there would be in a fifty-pound sack of flour.

A. There would be approximately forty milligrams, calculated as nitrogen. If you calculated it as nitrous acid—

Q. (Interrupting) Well, pardon me,—I don't know anything about a milligram. I want to know what portion of a pound of this stuff, there would be in a fifty-pound sack of flour.

A. That will take me some time to calculate, because I always use the metric system in the laboratory. It is a

314 matter, simply of arithmetic.

Q. Yes. We don't know anything about that, here but

we know something about pounds and ounces?

A. I think perhaps I will have to look through the reductions in the arithmetic, to find all these equivalents, and grains—would you like it in grains?

Q. I want to get it in pounds or in ounces. What would be the fraction of a pound there would be in a fifty-pound sack

of flour?

A. Pardon me. I see what you mean. I think I shall have to ask somebody how many grains there are in a pound, or else, how many milligrams there are in a pound. I shall be very glad to do your arithmetic.

Q. Don't ask me.

The Court: Oh, you don't need to give that. Just simply take that and divide it by twenty thousand. That's all there is to it.

Mr. Scarritt: He can do it in a minute, if the Court did it in his head.

Mr. Butler: Why don't you do it for him?

Mr. Scarritt: It would be one ten-thousandth of a pound.

Mr. Smith: I think that this witness has been giving some figures that are confusing, and I want to get him to straighten it out.

Mr. Scarritt: About one ten-thousandth of a pound.

Mr. Butler: All right, if you say that is right.

Mr. Scarritt: I don't say that is exactly right.

Mr. Helm: I think be can calculate it much easier using fractions of a pound, because there is one and eight-tenths parts —1.8 pounds in a million pounds of flour.

Mr. Smith: Yes.

Mr. Helm: Divide 1.8 by a million.

The Witness: I was beginning at the wrong end.

315 Mr. Helm: Then, multiply by fifty.

Mr. Smith: Now, let the witness do this. I will call you to the stand later.

The Court: Now, gentlemen, you must either agree, or let the witness do the figuring, and not everybody be giving figures. We have all been giving figures, here. I take as much blame as anybody else. This is purely a matter of arithmetical calculation, but it is a matter that anybody is likely to get wrong on. Everybody has his own method of computing decimals.

A. I make it four ciphers—point four ciphers, nine. That is, if I have got the point in the right place. I will stand corrected on the arithmetic. Is that right?

By Mr. Smith:

Q. That is, nine hundred-thousandths, isn't it? You said decimal point four ciphers.

A. Yes, nine hundred-thousandths.

Q. Nine hundred-thousandths?A. If my arithmetic is correct.

Q. Well, I guess it is. That is, nine hundred-thousandths of a pound, in a fifty-pound sack of flour?

A. Calculated as nitrogen.

Q. Yes, sir.

A. It would be four times that, if you calculated it as nitrous acid.

Q. The same as you calculated here (referring to a document)?

Mr. Butler: Judge Scarritt, what was your figure?

Mr. Smith: He had one ten-thousandths.

Mr. Scarritt: I had it nine ten-hundred-thousandths.

By Mr. Smith:

Q. Now, coming down to this loaf of bread that you made out of bleached flour. If there were nine hundred-thousandths in a fifty-pound sack of flour, what would have been the amount in that loaf of bread you made out of bleached flour?

A. Oh, from a third to a half of that.

Q. Well, it doesn't take a fifty-pound sack of flour to make a loaf of bread, does it? You measured the amount there was in a fifty-pound sack, didn't you?

A. Oh, you mean in a loaf of bread?

Q. Yes, sir. I am trying to determine the amount of this there is in the loaf of bread you made.

A. It depends on how large a loaf—how much you use. If you will say how much flour—

Q. (Interrupting) How much flour did you use in that loaf of bread you made?

A. Three hundred and forty grammes.

Q. How nearly a pound?

A. Oh, I would have to calculate. If it was-

The Court: (Interrupting) That would be owing a good deal to what bakery you buy of.

Mr. Smith: I am trying to get at the loaf of bread he made.

The Court: Oh. I thought you were talking about an ordinary loaf.

Mr Smith: I am talking about his.

A. (Continuing) Those were small, experimental loaves, such as are not cooked for use, and I really haven't the figures,—how much the loaf weighed. You want to know how much was used in the bread.

Q. Yes, sir. Assuming, now, that all of this which was in the flour remained in the bread, after you baked it, I want to know how much of this there was in the loaf of bread which you baked? What would be the proper decimal, to represent that?

A. I don't know that I baked any loaf of bread, of this par-

ticular seizure.

Q. Well, you had others that you tested about the same time, didn't you?

The Court: Oh, take a loaf of a common weight, Mr. Smith. I don't know what they weigh, myself.

Mr. Scarritt: He gave the weight.

The Court: Well, if it's one pound, or if it's a half a pound,
—whatever it is, it is a simple arithmetical proposition.

317 Mr. Scarritt: Yes.

The Court: When you get down to it, it is primary arithmetic, that any knee-breeches boy can figure out.

Mr. Smith: No, but this witness is having a good deal of trouble with it.

The Court: No. Now, that is not fair, Mr. Smith. Over there sits a scientist, and there is Judge Scarritt, and you, and the witness, that all disagree.

Mr. Smith: I am taking what the witness said.

The Court: I know, but I know what the witness said, and what the scientist said, and what Judge Scarritt said.

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Mr. Smith: I am not asking for the scientist to do the arithmetic on this.

The Court: Treat the witness fairly.

Mr. Scarritt: We have a right to disagree with the witness.

The Court: We have no right to disagree on the rule three. The school boys, down here, in knee breeches, haven't any right to disagree on the rule, three.

Mr. Scarritt: What did you get, if Your Honor please.

The Court: I didn't figure it out, but a fifty-pound sack of flour is about one twenty-thousandth of a million don't you see?

Mr. Scarritt: Yes.

Mr. Smith: I am not doing this, simply to get figures. The witness testified, the Court will remember, that he could tell the difference in the taste of the bread, now, I am trying to find out the amount of this there was in that loaf of bread.

The Court: Don't you know how to figure.

Mr. Smith: Well, I may not be as accurate as he is.

Mr. Butler: I think we will enter an objection to these unnecessary computations.

318 The Court: Objection is sustained.

Mr. Smith: I contend that it is not unnecessary. I think I am entitled to that.

The Court: I can figure it out, in two minutes, and every gentleman in this room, who has been to a common school can do the same.

Mr. Scarritt: I haven't the amount of flour.

The Court: Well, a loaf of bread is about as indefinite as the size of a rock. You have got to get at the size of the loaf. Now, this is no matter of levity. It is a matter of importance, now, he starts out with a million parts of flour. Now, Mr. Smith reduces it to fifty pounds. That is one twenty-thousandth part of a million. There would be twenty thousand piles of sacks, fifty pounds each. Now, a loaf of bread, or the fifty-thousandth, or a hundredth, or whatever it may be, that sack of flour,—well, the objection is sustained.

Mr. Scarritt: He is the only one knows.

The Court: No, he isn't. I know, you know, and everybody knows.

Mr. Scarritt: I know, but I mean the amount of flour in his loaf of bread. That is what I am talking about,

By the Court:

Q. Did you weigh it?

I didn't bake any of the regular size.

The Court: Let's go on.

By Mr. Smith:

Q. Did you see the loaves of bread which you tested, and in which you said you could detect a difference in taste?

A. I did.

Can you tell the jury about the amount of flour 319 that it took to bake one of those loaves of bread?

Three hundred and forty grammes. A.

Well, now, I suppose I ought to know, how to reduce three hundred and forty grammes to pounds, but I do not, unfortunately, so, can you tell me how many ounces there were in that? Was that more or less than a pound of flour?

A. It was about eleven ounces,

By the Court:

Q. Eleven sixteenths of a pound?

Something like that. A.

Well, generally speaking? Q.

A. Yes, sir. If I may explain-these were test loavessmaller than are made for domestic consumption.

By Mr. Smith:

Q. Yes? A. Perhaps a quarter as large.

Now, you testified as to further examining this flour, for the purpose of determining the ash content.

A. Yes, sir.

I wish you would tell the jury how you determined that. Q.

I weighed out a certain quantity of the flour in a platinum dish, about that size (indicating). I will say that in the laboratory we use the platinum a great deal, because it is not affected by ordinary heating, to red heat, or by common The dish was carefully weighed, and then a certain amount of the flour was put into the dish-about a one-sixth of an ounce. The dish was then put over a flame-a gas name-kept at a heat just short of a red heat, and burned, until it was reduced to a char. Then, it was put in an oven a little furnace,-and burned until nothing but the mineral matter was left. It was then taken out and cooled, weighed, and that gave us the amount of ash. I will say that flour is much more difficult to burn than wheat. It takes a longer time.

Q. Yes. And in this flour, you found there was fifty-320

seven hundredths of one per cent of ash?

Fifty-seven one-hundredths. Fifty-seven one-hundredths? Q.

Yes, fifty-seven hundredths of one per cent of ash. A.

Of ash? Now, what does that indicate, that the flour contained with respect to bran? A. With respect to-

(Interrupting) The amount of bran in the flour. Does

that indicate anything. A. Indirectly.

What?

It indicates that it contained more of the inferior part of the grain-if that is what you call the bran,-than would

he present in a patent flour.

Q. Yes. Now, in that connection, you said, I think, that, as you regard it, patent flour could go up to forty-three hundredths of one per cent? A. Forty-three hundredths.

Q. Yes?

I never found a patent that went beyond that,

Q. Have you ever seen a schedule, fixed by the Department of Agriculture, or any other department of the government, determining what should or should not constitute patent flour?

No. sir.

Have you ever seen any rule or standard, or grade, established by any food or health department, establishing what should or should not constitute patent flour?

A. Not to my knowledge.

Has there ever been, to your knowledge, any rule promulgated, either by the Department of Agriculture, at Washington, or by any of the Food and Drug officers of the department at Washington, or any food or drug commission, or health department of any state, or of the federal government, that has determined a standard for the grade of patent flour?

A. May I ask whether you mean whether this has been

publicly announced?

Q. Yes, sir.

I know of no such rule, or order, except, I might men-

tion the proceedings of the New Orleans trial.

But, you have never known of any rule being promulgated, or order established, or grade laid down by any department of the government, or by any food commissioner,

or any health commissioner, any place, have you? 321 A. I don't happen to know of such, laid down for pub-

lic use.

No. Or, as a suidance for millers,

I don't happen to know of any such.

Now, the amount of patent flour that can be obtained from wheat, is dependent, somewhat, on the character of the wheat, is it not. A. Dependent, somewhat.

Q. And it depends somewhat on the equipment of the mill,

does it not? A. It does.

Q. And it depends somewhat on the competency of the miller, does it not? A. It does.

2. Did you ever know two millers to have exactly the same

standard to which they adhered, at all times?

A. I don't think that is a question that I am competent to answer.

Q. All right. Have you made any examination of the standards or per cent of patent flour, adopted by different mills, in different places? A. Read the question.

(Question read).

A. Oh, I have seen statements, repeatedly, with regard to the standards, but I don't happen to have [an] definite figures.

Q. Each one has his separate standard, does he not?

A. For patent flour?

Q. Yes, sir. A. That I can't say.

Q. Well, do you know that they do not? A. I don't know.

Q. You know, do you not, as a matter of general knowledge, or from your experience, that different millers get more than others? A. Get more patent?

Q. Yes. A. Yes, sir, I do.

Q. Now, as a matter of general knowledge, don't you know, and from your investigations, that millers, some of them from their improved machinery, and their special facilities, get nearly one hundred per cent? Don't you know that?

A. No, sir.

Q. Do you know that they do not?

Λ. I have never seen any.
Q. You have never seen any?

A. I have never seen any one hundred per cent patent.

Q. But you are not prepared to say that they do not, are you? A. I think it is impossible.

Q. Now, you have made a considerable study of the bleach-

ing of flours, have you? A. Yes, sir.

Q. Have you made that study in mills, where the bleaching process was used, or has it been largely in your laboratory?

A. The chemical work was done in the laboratory. Sam-

ples many of them,-

Q. (Interrupting) You haven't gone into the mills, and seen the operation?

A. Oh, very many times, yes, and have obtained samples

from the mills.

Q. Yes? Now, in these experiments, that you have performed for the purpose of determining the strength of the gluten, and the acidity, and the flavor, and the color, and the fat, and so on—with what have those experiments been performed. A. With what flours?

- Q. Yes, sir, with what flours? A. A variety of flours.
- Q. Where obtained? A. Different parts of the country.
- Q. Where bleached?
- A. Bleached in the laboratory, many of them.
- Q. Where were the others bleached?
- A. Bleached in mills.
- Q. Have you ever gone to the Lexington Mill & Elevator Company, or, have you ever sent to the Lexington Mill, and got from it samples of its bleached and unbleached flour, in order that you might determine the relative acidity, or the flavor, or the quality of the gluten, from its mills?
  - A. I don't remember such. I may have.
- Q. State to the jury, if you can, to what mills you have gone, or have sent, and have got samples of bleached and unbleached flour, from the same grade of wheat, in order that you might determine the relative strength of the gluten, or make the acidity test, or the other tests that you have been engaged in.
- A. Where I have personally been to the mill and got the samples?
  - Q. Yes, sir.
- A. Such samples have always been obtained for me 323 by the official inspectors of the department, and submitted to me.
  - Q. Well, in what form do those samples come in?
  - A. They come in under their seals,
  - Q. And do they contain both bleached and unbleached flour?
  - A. We have had such.
  - Q. How many of those have you had?
  - A. I don't know exactly.
- Q. Well, what is the fact, as to whether your experiments, as a rule, have been made with this flour that came from the mill, or flours that you bleached in your laboratory?
  - A. I have done both.
  - Q. Well, which has constituted the greater portion of it?
  - A. Oh, I haven't counted them, sir.
- Q. Will you give me the name of a single Nebraska mill, from which you have obtained both bleached and upbleached flours, of the same grade?
  - A. I have a table here, showing some results. Updike Mill-
- Q. Now, what did you obtain from them? Samples of both the bleached and unbleached flour? A. Yes, sir.
  - Q. When was that obtained?
  - A. A couple of years ago, approximately.
  - Mr. Scarritt: I can't hear a word you say.
  - A. (continuing) A couple of years ago.

By Mr. Smith:

Q. Give me any others from which you obtained samples both of bleached and unbleached flour.

A. Bleached by the Alsop process?

Q. Yes, sir. Yes, sir.

A. Fremont Mill Company, Freemont, Nebraska.

Q. Yes? Did you obtain these, or did [you] assistants send them to you?

A. They were obtained, either by inspectors, or some one

representing me.

Q. I see. And it was some that was sent to you that way?

A. I do not have the data right here.

Q. Now, can you tell us what the ash content of a straight flour is?

A. It is more than the patent, from the same mill-

324 ing. It is variable.

Q. Well, that doesn't answer my question, I think. Can you tell the jury what would be the ash content, of what you have denominated a straight flour.

A. It would vary according to the milling process, and the

grade of wheat.

(). Between what figures?

A. I don't think I could give you the limit. It is such an indefinite thing. But the percentage of ash would be greater than in a patent.

Q. Can you give us the ash content of a clear flour?

A. That, also would vary, but would be higher than in a patent, and, for the same milling, higher than the straight.

Q. Now, you testified that you tested some of this flour, in question, to determine its color where you used what you called "the gasoline test". Now, tell us how you prepared that test. A. How I prepared the test?

Q. How you prepared your test material. You didn't just

put some flour in gasoline? A. Oh, yes.

Q. Without any coloring matter.

A. Certainly. Colorless gasoline.

Q. How did you prepare the standard by which you were

to determine.

A. I used chlorate of potash. That is a yellow chemical, and dissolved five grammes of chlorate of potash in water, and made it up to a liter, with water. Then, from that stock solution, I made a solution of ten c. c., of the stock solution, diluted to one liter. That is an arbitrary standard for color.

Q. I see. That is the method you used in determining the

color—the amount of coloring matter in this?

A. The amount of gasoline soluble coloring matter.

Q. Yes? Now, in your investigation of this flour, you determined that it had not been bleached with nitrogen peroxide.

A. It had been bleached by some process that introduced nitrous acid in the flour.

Q. Yes? And what did you determine it was that had in-

troduced that?

A. There are a number of processes that would do that, 325 and it would be impossible, from a chemical examination to say whether it was the Alsop, or the Andrews, or some other, and that, of itself, isn't—

Q. (Interrupting) Well, what I am trying to get at, Doctor, what did you determine, yourself, was the bleaching agent?

A. I didn't determine that.

Q. Well, can you tell the jury, now, what was the bleaching agent? What was it that made this flour turn whiter?

A. The flour had all the characteristics of a flour that had

been bleached with nitrogen peroxide.

Q. Are there any other bleaching processes that will bleach the flour—and I don't have reference, now, to the manner of its creation or generation,—but, are there different agents that would bring about the same result?

A. I understand so, but I can't say, from personal ex-

perience.

Q. How many agents do you know that would produce the same result?

A. The only agent that I have had personal experience

with, is nitrogen peroxide, and aging.

Q. Nitrogen peroxide coming in contact with the water content, and that creating some other agency,—that brings about the result?

A. Well, I don't mean to say that. I would judge the nitro-

gen peroxide, itself, brings about the result.

Q. I see.

A. There are a great many things taking place, almost instantaneously, and I don't know which comes first.

Q. It nitrogen peroxide a gas?

A. Yes, sir, that is a gas.

Q. I believe you described is as being heavier than air.

A. Yes, sir.

Q. What is its specific gravity?

A. I can't state that, offhand. It is a matter of record in

all the chemistry-

- Q. (Interrupting) Well, tell us about that. Tell us about how much heavier than air it is, whether twice as heavy as air, or three times or four times.
- A. I would not attempt to say, without looking up my book.
  - Q. But, you know this is much more heavier than air?

A. Yes, because it will pour.

326 Q. That is, it settles?

A. Yes, it settles. It is like carbonic acid. I do not pretend to know the weight, altogether, in those cases. We

don't carry those things in our mind.

Q. Now, if it is heavier than air, how does it come that the nitrogen peroxide which they had in this bottle, yesterday, has not remained in the bottle, but has all escaped?

A. I see some of it in there now.

Q. Do you see as much there as you did yesterday?

A. I don't know how much there was, yesterday, I didn't ex-

amine it, but it seems to me I see some, there, still.

Q. Well suppose you were to uncork that, would it escape in this room?

A. I would rather wait until I get through my testimony,

because it gives me a headache.

Q. I am not asking you to uncork it, but I am asking you if it would do that, if you did uncork it.

A. It may, by the diffusion of gas, in time.

Q. If it is heavier than air, why wouldn't it remain in there?

A. The gases diffuse, as I understand it. You are getting, now, into the realm of physical chemistry, and I wouldn't want to go extensively into that, except to state that it is my general knowledge that gases diffuse, if one is heavier than the other, the same as liquids. They diffuse.

Q. Well, is nitrogen peroxide a volatile substance?

A. Nitrogen peroxide is a gaseous substance.

Q. Well, is it volatile?

A. Well, volatile means, when a solid or liquid goes into a gas, and, if is a gas already, it has reached that condition.

Q. Well will it raise in the atmosphere, and diffuse itself through the room, if we had some of it in a receptacle, here?

A. It might, with time. It might, with time. Q. But it would take a good long while?

A. It wouldn't go immediately. I don't know how long it would take. Gases diffuse. That is well-known law, that every chemist knows, that that takes place, especially if there are currents of air to help it take place.

Q. Now, the substance which you found in this flour, is what chemists denominate as a nitrite, is it, or nitrite re-

acting material?

A. Nitrite reacting material—Nitrous acid.

Q. Yes? A. Either free or combined.

Q: Is that a volatile substance. Will it escape?

A. That term includes several substances.

Q. Yes?

A. And that very designation indicates that no one is specifically mentioned.

Q. What is the effect of heat, on it? A. On which?

Q. Nitrites, which you found in this flour.

A. The effect of sufficient heat would be to change, or remove that.

Q. How much heat would it take, to remove them?

A. I couldn't say, where the point would come, where it would be removed. I have tried no experiments on that.

Q. Have you experimented any with flour, to determine what was the effect of heating it, as to what was the effect upon the amount of nitrite that was retained in the flour?

A. I have not. I only know this, that, during the summer weather, the nitrite reacting material slowly disappears, as such. Even during the winter, it slowly leaves.

Q. Well, do you attribute that to the heat?

A. Oh, heat must be a factor, I think. Heat is almost al-

ways-I think quite always a factor in chemical changes.

Q. Have you ever examined any of the bread that you baked from any of this bleached flour to determine the amount of the nitrite that was left in the bread, as compared with the amount that was left in the flour? A. Which bleached flour, please?

Q. Oh, any bleached flour. I don't care.

- A. I have.
- Q. Have you, of the flour that is seized in this case?

A. I have not.

Q. Have you ever taken flour that is bleached in the mill, and where the amount of nitrite found in the flour was substantially the same as what you have testified was found in this baked bread, as the ordinary housewife bakes it, using yeast,

let the bread set over night, then put it in the oven and bake,—have you ever examined that loaf, to determine whether or not there was any nitrite present in it?

A. I have examined such bread, but I don't know whether

the amount was just the same as in the seizure.

Q. Well, how did the amount which you found in the bread in that case, compare with the amount which was in the flour in that case?

A. Without looking up my figures, or anything of that kind, I would rely upon my general conclusion.

Q. Yes.

A. That from one-third to a half remained in the bread, and, from this degree of bleaching. That, you understand, is just a rough approximate.

Q. A rough estimate?

A. An opinion, based upon experience.

Q. Now isn't it true that where yeast is used in the baking of bread, that this yeast entirely removes the nitrite from the bread, and that none of it is found in the bread afterwards?

A. No, sir, it is not true.

Q. How many experiments have you performed, to determine that question?

A. Quite a good many. I don't know how many.

Q. Well, how many does that mean?

A. Oh, maybe twenty-five, maybe fifty, maybe a hundred.

Q. And you found it in each and every one?

A. Invariably, where there was nitrite reacting material in the flour, we found it in the bread.

Q. Was that in flour which you bleached in your laboratory,

or some you got from a mill. A. Both.

Q. When you bleach flour in your laboratory, describe the

operation by which you bleach it.

A. The flour was introduced into a tall, two-gallon bottle—a bottle, about so high (indicating)—not two-gallon—two-liter. Wait a minute. I think it was—I don't know the points of a gallon, but I think it was either a two or a four-gallon bottle. At any rate, a bottle so high, about that big around (indicating).

Q. Yes?

A. Flour was introduced into the bottle, and gas was introduced through perforated cork, and run in a certain distance. I did not use, directly, the peroxide gas, but used another gas which, on contact with the water, immediately forms this peroxide. It is all converted into the peroxide, and that is simply a means of making the peroxide gas. We use what the chemists know as nitric-oxide. This has less oxygen in it, than the peroxide, but, immediately on coming in contact with the air, this colorless gas forms the brown-

ish yellow peroxide gas. Q. Yes?

A. That was introduced into this bottle, and then the glass stopper was inserted, and the whole shaken.

Q. You, then, didn't generate yours by electricity, at all?

A. No.

Q. You used chemicals—liquids?

A. In the laboratory, yes, sir.

Q. Didn't you have any chemical apparatus there, by which you could bleach flour?

A. Unfortunately, all my attempts to secure such apparatus, were without avail.

Q. That was too bad. You have been making experiments on bleached flour for a good many years, haven't you?

A. I wouldn't say a good many years, because I think bleaching has not been in use for very many years.

Q. Well, you have, for the last three or four years, haven't you? A. The last three years, perhaps.

Q. And during all this time, the millers throughout the country have very generally been using this Alsop process, haven't they? A. I think not, sir.

Q. How generally?

Mr. Butler: I think we will object to that.

Mr. Smith: Well, I will withdraw that. I concede that is not proper cross-examination.

The Court: Mr. Smith, would it suit you to stop at this point, or would you prefer to go on?

Mr. Smith: Oh, I would just as soon stop, now.

The Court: We will stop, then, now, till tomorrow morning.
You may ask a few questions in the morning, should you
330 so desire. (Addressing the jury) Well, keep in mind,
gentlemen, what I have said to you heretofore. We will
adjourn until tomorrow morning.

(Adjournment taken as above ordered)

Morning Session.

Kansas City, Missouri, Saturday, June 4, 1910.

Court met pursuant to adjournment and the further hearing of this cause was resumed as follows, to-wit:

Mr. Lyons: If Your Honor please, in this case we desire certain sacks of flour that are now in the possession of the marshal turned over to us for the purpose of making certain further experiments during the course of the trial. I have here an order for the marshal to turn over to us two sack of flour.

The Court: It will not delay the trial?

Mr. Lyons: No, sir.

Mr. Smith: An order covering the turning over of two full sacks to each of the parties, no objection to that.

Mr. Lyons: I can just add that below that order.

The Court: And like delivery of two sacks to claimants.

The Court: The objection made upon yesterday to the question of tasting—I have forgotten, does it include the odor or not—of the bread by the witness Winton, is sustained, and the court will rule in pursuance of that ruling, arguing that the court will not give the time to make the

tests.

To which ruling of the court each party excepts.

Mr. Smith: As I understand from that, if either party wants to make any proof as to taste, and so forth, they must make it outside and testify to results rather than to make the actual demonstration here.

The Court: That is well stated,

Mr. Lyons: Well, if your Honor please, will we not be in this position, that if we make certain tests outside of the courtroom that we can exhibit them here if we so desire.

The Court: Oh, that may be, of course we will cross that bridge when we get to it.

Dr. A. L. Winton, in continuance of his cross-examination, further testified as follows:

By Mr. Smith:

Q. Just one or two questions this morning, Professor. This nitrite or nitrite reacting material that you say you found in the flour, is that an organic or an inorganic nitrite?

A. It is my opinion that it is largely the free nitrous acid, and not combined at all, that is an inorganic, wholly considered an inorganic acid, but if it is combined it might form organic or inorganic combinations in the flour.

Q. My question is to get your opinion, which is it, an in-

organic or an organic nitrite?

A. It is my opinion that it is not a nitrite or a nitrate,

but it is a free acid, quite usual.

Q. Well, is it your opinion, then, that there is not in this flour what you call nitrite?

A. I have no evidence that there is any nitrite in the flour.

332 Q. In the flour? A. But such may be present.

Q. But you are not prepared to say that there is in this flour any nitrite at all?

A. I am not prepared to say that the nitrous acid is com-

bined to form nitrites.

Q. Are you prepared to say to this jury, that in this flour which you examined which was seized under the writ in this case, there is present any nitrite. I think that ought to be answered, yes or no.

A. I am not prepared to say that there is any nitrite, but

there is nitrous acid.

Q. Now you tested the gluten of this flour, I believe you said? A. Yes, sir.

Q. Really I don't know whether you said you tested the gluten of this particular flour or of others?

A. Well, of other flours I was testifying to.

Q. You didn't test the gluten of the flour that has been seized? A. I did not personally.

Q. So you are not prepared to say anything as to its strength or volume? A. Not personally.

Q. In the glutens that you did examine did you test them

for strength or volume or both?

A. For physical characteristics as determined by the feeling in the hand, and not by expansion, or anything of that sort, with special apparatus.

Q. Did you test them for and weigh the gluten to deter-

mine the relative weight, before and after?

A. The amount, the weight, yes, sir.

Q. Which, weight or volume? A. Weight, weight. Q. Volume you did not? A. Volume I did not.

). For strength you did not?

A. No, except in this way, not quantitatively, merely the judgment of the strength from the usual pulling and feeling tests.

Q. Well, you simply pulled and felt of it with your fingers?

A. Yes.

Q. Well, did you test its strength by any appliance by which you could determine accurately just what [is] 333 strength was? A. No, sir.

Q. So your judgment as to the strength of it is simuly that which you formed by fingering it or handling it with your hands or working it with your fingers? A. Yes, sir.

Q. Now, in making this test where you simply worked the dough with your fingers did you have samples of both the bleached and the unbleached flour from the same mill and the same grade of flour?

A. In the case of this seizure?

Q. No. sir.

A. In other cases, yes, sir, and the same, bleached and unbleached.

Q. Well, was that bleached in your laboratory or by the

mill? A. In our laboratory.

Q. Your laboratory, and in bleaching in your laboratory about what amount of flour would you bleach each time?

A. Bleach usually one or two kilograms, that is, two and a half to five pounds.

Q. That would measure in volume about how many quarts?

A. Two kilograms would be—I can only give you a very rough estimate on that.

Q. I think the jury will get a better idea if you give

it in pints and quarts rather than kilograms.

A. Kilogram, often use about four and a half pounds of the flour, a pound in a pint, it would perhaps be four and a half pints.

Q. Or two quarts, or a little over two quarts?

A. Oh, something of that sort, of course,

Q. That is about the amount that you ordinarily use when preparing for an experiment in your laboratory, was about two quarts, or such a matter?

A. That was the usual amount we used in bleaching.

Now, when you went out in your laboratory to bleach that, you made your bleaching agent by the use of chemicals and not by the use of electricity? A. Yes, sir, that is true.

Q. Now, would you put that flour in a closed bottle or jar

or receptacle? A. Yes, sir.

Q. And then would pour the bleaching agent into the A. Yes, sir. 334

Q. What kind of a receptacle did you use?

Oh, like this, quite like that, only it was larger. A.

I don't know what you mean by that; you mean that large bottle that is closed?

Yes, sir; I think it was about twice as large or half

again as large.

- Q. As it, and in that you would put the amount of flour you indicated? A. Yes, sir.
  - And then you would force the bleaching agent into that?

Through a tube. A.

Going into it? A. Yes. Q.

Now that bleaching agent, as you forced it into that, Q. could you see it, the bleaching agent? A. Oh, yes, sir.

Very distinctly? A. Oh, distinctly enough, Q.

Well, was it the color of the nitrogen peroxide that was Q. exhibited to the jury here during the progress of this trial? Yes, sir. A.

Its color was as distinguishable as that, was it?

A. I think so; of course it depends on whether it mingles with the air.

Yes, but when it was forced into the bottle which contained the flour, its color was more or less as the nitrogen peroxide that has been exhibited here to the jury, or substan-

tially so?

It would when it first came out of the tube, but not when it was mixed with the air. In making these tests I always noted the color of the gas as it came in contact with the air. to make sure that everything is right, but after it mingled with the air I couldn't see it any more.

When it was forced into this glass bottle or receptacle in which the flour is contained the cork or stopper was in the

bottle?

A. Another cork or stopper, not the glass one but the one used to close this.

Q. So as to make it air tight or substantially so?

A. Reasonably so.

Q. Now, then, did you shake it up? A. Shook it up. 335

How long did you keep it in there?

Oh, just a few moments, a few minutes. A.

Well, that may mean ten or may mean thirty?

Not over five minutes. A.

Well, what would be your judgment as to the length of Q. time you subjected your flour in the middle of this water in the bottle—five minutes? A. Five minutes.

Maybe a little more? Q.

A. I don't think so, I would always pour it out.

You did not keep a record of the time?

Oh, I figured on five minutes. A.

- You figured on keeping it in five minutes. A. Five min-Q. utes.
  - And then you removed the cork and took out the flour? Q.

A. Yes, sir.

Now, what chemicals did you use to prepare this nitrogen Q.

peroxide?

A. That is made from iron chlorid, and hydro-chlorid acid; it was freed from any possible acid by means of caustic soda that removes any hydro-chlorid acid, some that was used in generating, yes.

Q. Now, can you tell the jury how many parts of nitrogen peroxide you had in the receptacle as compared to the amount

of flour? A. I might have to do some calculating.

Well. I would like to know because I think it is somewhat material in this case to know the relative proportions between your nitrogen peroxide and the volume of flour that you was bleaching. A. Nitrogen peroxide?

Yes, sir.

I used in-of course. I have made a great many different bleaching tests, using different quantities.

Q. Yes, but they were all substantially the same, were they

A. Oh, no, sir. not?

O. All right, give me the range.

Some were a hundred times heavier than others; I used all the way in one series of experiments from five cubic centimeters of gas to five hundred, five to five hundred, and

in a very recent series, the products of fifteen different 336 mills, I used uniformly twenty cubic centimeters,

Twenty cubic centimeters of gas to the volume of flour that you had in there? A. To a kilogram of flour, that is.

So in performing these last tests you used twenty cubic centimeters of gas to a kilogram of flour? A. Yes, sir.

Q. And kept the flour in this closed receptacle exposed to

that for a period of about five minutes? A. About five minutes

And then it was after having done that, that you made your tests?

A. Made them the next day, it was my opinion that the gas might remain mechanically commingled with the flour, and I always save it till the next day so as to let any that would go

off, go off.

Q. But in the other tests that you made and from which you have derived the knowledge which has enabled you to testify in this case and on which you have based your testimony, you say all the way from five cubic centimeters of gas to five hundred cubic centimeters of it in bleaching the flour that you had in the receptacle? A. Per kilogram of flour.

Q. Yes, sir, per kilogram of flour.

A. If I used two kilograms I used forty cubic centimeters; but let me state that I have not based[by]conclusions on those experiments alone, because afterwards I repeated similar experiments using gas generated by the Alsop bleacher, and in that case got all these results which corresponded in every respect with those that came by bleaching in the laboratory.

Q. Yes, but in bleaching in your laboratory you have used from five cubic centimeters of gas to five hundred cubic centi-

meters of gas to the kilogram of flour? A. Yes, sir.

Q. And at the time of those experiments you kept the flour contained within the glass receptacle with the cork in it, making it substantially air-tight? A. Yes, sir.

Q. And you kept the flour exposed to that solution, or whatever you may be pleased to determine, for about five minutes?

A. Yes, sir.

337 Q. Sir? A. I will state that.

- Q. Now, have I stated the facts correctly as to what you did?
- A. You have, I think, if I may allow just one explanation.
  Q. Well, I am trying to get the facts, and that explanation may follow, let's get the facts, are those the facts?
- A. That is a fact, but if I made this explanation it will make the facts clearer and more exact.

Q. Let's have it, we want all the light we can on it.

A. I would say that immediately on shaking the flour with this bleaching gas, the reaction appeared to be complete.

Q. Yes, sir.

A. The additional shaking after the first two or three jolts was for the purpose of getting every possible trace of it absorbed so I could get my results more comparably.

Q. Yes.

A. Bleaching seemed to effect immediately.

O. Yes, sir. A. The color changing at once.

Q. Yes, sir. A. The color changing at once.
Q. By immediately you mean within fifteen seconds or twenty seconds? A. Well, almost a few shakes, and then look at it.

Q. But in order to make sure that every particle was bleached and that it absorbed all you could, you kept it there for five minutes?

- A. Not so much to have it every particle bleached but as to have a definite time and to get as much out of that gas as I could.
- Q. Well, whatever the purpose was, or whatever your view was in doing it, the fact is that you kept it subject to that treatment for about five minutes, didn't you?

A. It was shaken for about five minutes.

Q. Yes, how often would you shake it during that time?

A. Oh, shake it, keep it a-going.

Q. I see, and then was it that same flour, bleached in that method, that you bake into bread and made determinations?

A. Yes, sir.

- Q. Now, does the relative amount of nitrogen peroxide as compared with the amount of water contained in the 338 flour have any effect upon the value of it, on the net substance that is formed by the contact?
- A. It must have moisture in order to bring about the reaction forming nitrites and nitric acid. If the flour was absolutely dry I would suppose that the reaction would be different. However, I have never encountered that condition in practice.

Q. I see. Then you are not-prepared to say as to whether or not the relative amount of the nitrogen peroxide of the water would have any effect upon the nature or substance

formed by their coming in contact?

A. That question would involve a knowledge of what actually performs the bleaching in the fat. I may say that there are two distinct processes going on. One is the bleaching of the coloring matter with the fat, and the other is the formation of nitrous and nitric acids. Of course there are other changes that take place also. Now, to what extent those two processes are related I am not prepared to state at this time.

Q. I see.

A. If the peroxide directly bleaches the gas the color in the fat, the matter of moisture may not be so important.

Q. I see.

A. If, however, it is the nitrates or the nitric acids that do the bleaching, why, naturally, their formation from the moisture with the flour becomes an important item.

Q. Yes, sir.

- A. But practically the flour always contains moisture.
- Q. Yes, yes, we all agree to that. Now, in your investigations you have found that unbleached flour when exposed to the air and stand for a length of time, whitens, haven't you?

A. When stored in bags slowly whitens.

Q. Well, suppose you put an amount of unbleached flour in a pan, put it out on the top of a building and away from smoke, or things of that sort, but where it would simply be exposed to the pure air, and permitted it to remain there for a time. one or two days, four days, isn't it true that that flour would be whitened?

A. I never tried the experiment in that form, but I would not expect that you could note any whitening whatever in that length of time.

Q. Well, suppose it remained there for four days?

339 A. I would not expect that I could determine any whitening.

How long would it have to remain there before, in your

judgment as a good chemist, you would see a whitening?

I would say that I have never performed this experiment. My experiments have always been in bags.

Well, how long does it have to be stored in bags before you can notice the whitening process of nature?

A. I gave my figures yesterday as to the rate of-

I didn't take them down if you did. I just want to get from you a general statement of the length of time that would elapse before this whitening-whether it would be visible when carried on by nature?

A. It is a very slow operation. I will say that in my experiments I exaggerated the conditions, the flour was stored in small sacks, twelve pound sacks, in a well ventilated room.

Q. Yes.

And I am strongly of the opinion that if the flour had been stored under conditions very nearly like those encountered in the trade, that the bleaching would not have gone onthe natural bleaching from the air would not have gone on so rapidly, I think,

We are taking up time, what I want to get at is a statement about the length of time it takes before Nature's

laboratory makes it visible?

That depends on the conditions,

Well, under such conditions as you investigated how Q. long did it take?

After five weeks I was able to note a whitening. A.

All right, you tell the jury what is was. Q.

After two weeks I would question whether the whitening had been demonstrated there.

All right; but in five weeks it was demonstrated, wasn't

it?

A. In five weeks it was demonstrated to my satisfaction, and there was a slight whitening.

I wish you would tell the jury what it was that whitened that flour? A. I don't know.

Q. That is all. 340

The air, it was the air passing through the flour, but what the process is I can't say.

Q. In preparing your nitrogen peroxide used as a bleaching agent did I understand you to say that you used—what was it—tell us again what was it you used to create your

bleaching agent.

A. I made—I took an oxide from iron chloride, hydrochlorid acid and nitrate of potash, I omitted the nitrate of potash, possibly, of course you could not get the nitrogen without something that contained it; it was formed by the action of hydro-chlorid acid and iron chloride, ferrous chloride, on the nitrate of potash.

Mr. Smith: I think that is all, your Honor.

## Redirect Examination

By Mr. Butler:

Q. Referring to the tasting of bread to which I had addressed a question shortly before the end of the examination, I will ask you to tell us, not by conclusion or by comparison, good, better or worse, but by description of the taste itself, how each specimen of bread made from bleached flour tasted, and then tell us how each specimen of bread made from unbleached flour tasted?

Mr. Smith: I think I object to this as incompetent, irrelevant and immaterial and not a matter of expert testimony and as not proper rebuttal. What may suit one man's taste would be entirely disagreeable to another man's taste.

The Court: That is not the question. You may answer it.

Judge Helm: I desire to make this further suggestion, that this witness has already testified he didn't see the bread and he couldn't tell whether he was tasting it.

The Court: He may answer.

[Q.] In the case of patent flours, fifteen of which were examined both bleached and unbleached, and when fresh and after aging five weeks; in every case the bread from the unbleached flour had an agreeable flavor.

341 Mr. Smith: Now, Your Honor, I move to strike that out as not responsive and coming exactly within Your Honor's ruling that he couldn't tell.

The Court: Yes, I held rightly, or wrongly, that what, in my judgment is admissible as evidence—

Mr. Butler: I did not intend, Professor Winton, by my question to call for-

Mr. Smith: No, I don't think you did; I don't think you intended it that way.

The Court: By the words "how it tasted", he doesn't mean agreeable or disagreeable; he does not mean that.

Witness: What it tasted like.

By Mr. Butler:

Q. If you are able to tell by any word descriptive of taste, how the bread made from the bleached flour tasted, and then how the bread made from the unbleached flour tasted, do so. The ruling of the court, so you may understand it, is that we are not characterizing the taste by good, bad or indifferent, agreeable or disagreeable or comparatively. You have already told us they tasted differently. Now, we want to have you tell how it tasted, is what I am trying to get at, if there is any way that you can do so.

A. The bread made from the unbleached flour had a taste which I associated with vegetable oils, a nutty taste, a distinct flavor which I can best describe at nutty, whereas the bread made from the bleached flour lacked flavor; I was impressed by the absence of such a nutty flavor, and there was also in many cases a distinct flavor which was foreign to the

bread made from the unbleached flour.

Mr. Smith: Now, Your Honor, I think that comes within Your Honor's ruling and I move to strike that out; it is making a comparison between the two.

The Court: Yes.

Mr. Smith: That is not admissible under the court's ruling.

The Court: The last part of the answer will go out.

342 Mr. Butler: The words "that was not present in the other", under Your Honor's ruling, that may go out.

The Court: Yes, sir.

Witness: May I add the words "foreign flavor"?

Judge Scarritt: I move to strike that out because we don't know what foreign is; we are not foreigners.

The Court: Well, I assume that he didn't use the word "foreign" as in some foreign country, but foreign in the ordinary acceptation of the term. It may stay in.

By Mr. Butler (resuming):

Q. Now, in your cross-examination by Mr. Smith attention was called to the fact that the quantity of nitrite reacting material which you found in the specimen of flour contained in Exhibit 8 being exhibit 8, was 1.8 part per million and you said that that was computed as nitrous acid; it would be about

eight parts to the million, I think I am right as to the substance of your testimony in cross-examination now, am I?

A. It would be between three and four times as much com-

puted as nitrous acid that would be, I think, seven of-

Q. We will not trouble in getting the small figures. Explain how that is true, explain this method of chemical calculation, so that this nitrite reacting material computed as nitrite which was about two, but if computed as nitrous acid it would be about eight, as I understand it?

A. May I give an illustration?

- Q. Certainly, just make that so we can understand. All lawyers and jurors do not, as a rule, have to do with chemical calculations.
- A. Anyone who has been engaged in farming and in the country where the soil requires an artificial fertilizer is familiar with the term.

Mr. Smith: I think I will object to that as not an answer to the question, as incompetent, irrelevant and immaterial, it is a dissertation upon fertilizing in the soil; that is not responsive to this question.

Mr. Butler: Oh, no, it is simply an illustration of the quantity, amount of nitrite.

The Court: He asked if he could give an illustration, and Mr. Butler said "yes, you can", and you gentlemen were silent until you got down to a given point.

Mr. Smith: If I thought it at all pertinent I would not object to it but I don't think this is.

The Court: Well, you need not give it, then.

Q. (By Mr. Butler) Well, explain it without an illustration, define it, they do not like to have you show the one that you started upon I don't know what it is, but if you can tell us how

that comes about, do so.

A. Nitrogen peroxide, nitrous acid, nitric acid, the different nitrates and nitrites all contain nitrogen. The amount of this nitrogen, however, differs in these different products. Now, in the flour our nitrogen peroxide goes, as we know, into at least two different combinations—nitrous acid and nitric acid. Now, both of these contain nitrogen, but different quantities of nitrogen; also the amount of nitric acid, made from a given amount of peroxide, the amount by weight, would be different than the other acid; the amount of nitrous acid would be different from the nitric acid. Therefore as we don't know in the flour the exact amount of each of these that is present, it is impossible to calculate such and such an actual weight of nitrite reacting

material present. That acid indicates—I can approximate it but in order to be more exact, we put our results in terms of nitrogen, which is present in all of them; we can say positively there is 1.8 parts of nitrogen existing in the combination of nitrous acid or as nitrite. We can show there is so much nitrogen existing as nitrous acid, nitric acid, and nitrates provided we could determine those altogether; that is not true in this case. We say nitrogen, nitrous nitrogen, nitrogen as nitrous acid, because that is true, but, nitrogen does not exist as such in the flour or in the bread; it is combined to form this acid or this

nitrite, which are from three to five times heavier, those are the products actually present, but this is merely a 344 means of expression. Now, it would be foolish to say that the nitrogen existed as such in the flour; a great many thousand or hundred thousand times perhaps as much nitrogen exists in that flour in other forms; nitrogen exists there in the formation of the protein, the gluten; there is perhaps in that flour two or three per cent of that form of nitrogen; there is this similar amount of nitrogen existing in these other forms. We can calculate the per cent to the gluten more accurately, and thus give you the actual weight of gluten per cent. We cannot do that so accurately in the case of the nitrous acid and the nitrites, because we don't know the relative proportion. It is a little difficult matter to explain, perhaps, but I will say this is merely to be exact.

Q. Now, if computed as nitrous acid can you tell us how much there would be in a fifty-pound sack of flour, in this fifty-

pound sack of flour, Exhibit 8? A. Nitrous acid?

Q. Yes.

Mr. Smith: I object to that as not proper redirect examination, and not a matter proper for the jury. I was not permitted to get a computation from him yesterday, that is what I tried to get, but it was shut off.

Mr. Butler: If it involves a long computation we will have it made and put in by direct answer. I will withdraw the question for the time being, and have the computation made later so as not to delay.

The Court: You gentlemen can figure it up and talk to the jury, and they know how to figure as well as we do.

A. I have not the nitrous acid calculated, but I have a nitrite of soda corresponding calculated.

Q. Well, what would that be?

A. That would be three grains in a fifty-pound bag of nitrite of soda, nitrate of soda is not present in the flour.

345 Q. That is on the basis of the quantity recovered?

A. That is on the basis of the quantity that I recovered with the methods that I used.

Q. Now, how much nitrogen peroxide was used in the flour seized as compared with the amount represented by your re-

covery, can you tell us that?

A. From extensive experiments it is my opinion that only about one-fifth of the nitrogen peroxide used goes into this combination of nitrous acid as found by me in the flour at the time the analysis was made. I mean that the nitrous hydrogen found is only one-fifth the amount which was probably used.

Q. Well, now, on that basis how much gas in volume would be employed—was employed to bleach the sack of flour seized

and examined by you?

A. On that basis three hundred and fifty cubic centimeters, about one-third of a quart of pure nitrogen peroxide was used.

Q. Yes, now, the gas contained in Exhibit 6 when it was brought into court and exhibited to the jury and poured from the bottle containing it into a beaker, was a dilution of about four to one? A. Yes, sir.

Q. Of the volume in size or quarts of gas as the same dilution Exhibit 6 was when it was brought into court was employed to bleach the bag of flour Exhibit 8 which was shipped to your laboratory?

A. I calculate the amount is about one and three-fourths

quarts.

Q. A little less than half a gallon?

A. A little less than a half a gallon when the gas diluted, the four parts of water—of air.

Q. As was the gas brought in by Professor Shepard accord-

ing to his testimony?

A. About this bottle full, about two and one-third times.

Q. You said in cross-examination that the ash indicated the grade of flour, as to whether it was patent or not, and that it was impossible to make a ninety per cent patent. Will you explain to the jury what reference the ash has to the quality of flour as being patent, straight, clear and the like?

346 Mr. Smith: I object to that as not proper redirect, he having fully gone over it in his examination in chief, and immaterial.

The Court: He may answer.

To which ruling of the court claimant then and there duly excepted.

A. The heart of the grain contains less ash than the outer layers.

Q. Yes, you understand that I do not make my question clear; I mean the quantity recoverable, as to the quantity recoverable in patent flours, straight flours and clear. Now, the source of the ash I think you explained, if my memory is right, in direct examination, and we will not go over that again.

A. The patent contains the smaller amount of ash, the

straight somewhat more and the clear still more.

2. Now, as to be the amount of each, the range.

A. The patent contains less than forty-two or forty-three one-hundredths of one per cent; the straight and the clear contains larger amounts varying according to the condition; I have no distinct limit on these products. The straight flour from one mill, according to one practice, might have more or less than the clear flour from other mills with other practices, but in the same process, and the same mill, and using the same weight, the clear would have more ash than the straight.

Q. Now, in your cross-examination you said that chemical analysis would not disclose the method employed to make the nitrogen peroxide gas for the purpose of affecting bleaching?

A. It would only disclose the nitrous acid and when the

flour had been bleached artificially.

Q. Does it make any difference to the flour as respects the effect upon it how the medium NO2 in produced, whether by chemicals or by the flaming arc or any other method?

A. No, sir, it does not.

Q. Some of the cross-examination of Mr. Smith, was directed to the amount of nitric reacting material found

in the bread. I would like to have you, if you have the data at hand, to give us specifically some of your observations in that regard, showing the quantity of bleaching reagent used, amount of nitric reacting material recoverable from the flour, recovered from the flour, and the amount recovered from the bread?

Counsel for claimant objected to the question as incompetent, irrelevant and immaterial and not tending to prove any issue in this case.

The Court: What is the question?

Mr. Butler: I asked him to give us some instances of his examination with respect to nitrite reacting material from the bread, first the amount,—in bleaching—the amount recovered from the flour and recovered from the bread.

The Court: He may answer.

Mr. Smith: I object to it as incompetent, irrelevant and immaterial, and no proper foundation having been laid.

A. I made a great many experiments covering this point; I summarized the result, and I can give the summary or specific instances.

[A.] Well, very good.

A. I have summarized the result in this way: That from one-third to one-half of the nitrous acid present in the flour was found in the bread.

Q. Now, as to the quantities, give us the range of quantities that you found in the flour, and use the same terms of expression that you did here in describing your analysis of the particular flour that you examined from this seize, and how much you found in the bread—different quantities?

A. I have here a case where the bleaching gave in the flour

1.2 parts of nitrous nitrogen.

Q. Per million?

A. Per million, whereas in this case it was 1.8, that is quite a deal less. In the bread I found .52 parts, in other words, 5/12ths was found in bread made by the so-called domestic method. I have another case where the bleach-

ing was higher, where approximately 15/34th was found in the bread.

By Judge Helm:

Q. Can you state these all in decimals?

A. I have not calculated them, sir. The flour contained 3.4; the bread contained 1.55; in this second case that bleaching, however, was higher than in this particular seizure.

Q. What has been the extent of your experimentation upon this point, to-wit, the amount of nitrite reacting material found

in flour and found in bread?

A. Made a great many.

Q. For what period and about how long?

A. Over two years, over two years, and have used flour bleached in the laboratory, have used flour bleached in the mill using the Alsop gas, in the bleacher, and have also examined flour made bleaching by the Alsop process in mills as conducted

commercially.

Q. Now, I would like to have you give us the amount of nitrite reacting material found in the bleached flour that was not bleached in your laboratory, but that you procured in commerce and from mills, and the like. What I want to get at is the range and parts per million, the same terms that you expressed it in this analysis here, and how flour bleached ordinarily runs, as found in the market?

Mr. Elliott: In order to keep my memorandum straight, are these figures based on laboratory basis, now?

Mr. Butler: I will bring that out clearly. I cannot answer it positively, no; he used in this bread test just described,

flour from various sources, laboratory flour or that bought in the market, bleached flour that he got from the mill. Now, my question is, I want to get at the range of nitrite reacting material found in bleached flour from the mill, and in commerce, according to his experience, I want to get the range of that.

Judge Scarritt: Don't you remember going over that in your direct examination?

Mr. Butler: I think I did not just in that way, Judge Scarritt.

Judge Scarritt: That is my recollection. 349

Mr. Butler: I think he showed varying proportions in the bread, but I don't think I limited my question to the particular amount of nitrite reacting material.

Judge Scarritt: I am not sure.

Mr. Butler: I made a note of it, I know.

Judge Helm: Will you kindly have the witness state whether the examples he has just given were made upon bread baked from flour bleached in his laboratory or by-

Q. Yes, where you give particular instances.

A. Bleached in the laboratory.

Q. Both instances? A. I have here.

Q. Now go on.

A. I have here a case where the flour contained 1.88 parts of nitrous nitrogen per million.

Q. Where bleached?

A. Was bleached by the Fremont Milling Company, Fremont, Nebraska, and the amount of nitrous nitrogen was a shade more than this case in question; and in the bread I found 1.15 parts per million, in other words, a little more than half was present in the bread.

By Mr. Elliott:

Q. May I ask you to give the number plain again, we couldn't hear you, what was the amount of the flour?

A. 1.88.

By Mr. Butler:

Q. And in this case it was 1.08, in this case seized, here on trial?

A. And in the bread, always calculated to the same basis as the flour, calculated to the original flour, 1.15 in the bread.

Now, what I wanted to get at, if you can tell us from your memorandum or conclusion, the range of amount in the amounts of nitrite reacting material found in flour other than the laboratory bleached flour, that is, the flour which you purchased in the market and procured from mills with the bleach?

A. One-third to one-half.

Q. That is the amount still remaining in the bread?

A. Still remaining in the bread.

Q. And I want to find out whether one part to the million ranged from one to ten or forty or one to two or six recoverable in the flour just as you found it in the market and got it from the mill. Do I make myself clear,

A. Just again, if you please.

Q. You examined, you say, a great deal of flour?

A Yes, sir.

Q. That was not bleached in laboratories, but bleached flour bought in the market, and bleached flour procured from the mills? A. Yes, sir.

Q. And you determined in each instance the amount of

nitrite reacting material in such flour?

A Yes, sir.

Q. I want those determinations so as to give the jury an understanding of about how the thing runs, as far as your observation goes?

[Q.] Well, I have given one, I don't know.

Q. Well, now, give us the range. You said you examined a good many?

A. I have to study these results. I have a numebr, perhaps, I better give then in each of these specific cases.

Q. Yes, give the mill and all.

A. Another flour from the Updike Milling Company, Omaha, Nebraska, nitrous nitrogen in the flour 6.25; in the bread 5.13—5/6th, approximately in the bread I have already given one from Fremont, Nebraska. I have another, 5.36, in the flour.

Q. What mill was that?

A. That is the Fremont Milling Company again, Fremont, Nebraska, another flour; it was a low grade flour. The first was an 85 to 90 per cent patent, so-called; the second from the Fremont mill contained in the flour 5.36, and in the bread 3.50, somewhat more than half. I have another from the Wells-Abbott-Nieman Co., Schuyler, Nebraska, the patent, in the flour, 1.25; in the bread .62. Another 60 per cent patent from the Southwestern Milling Company, Kansas City, in the flour 0.20; the bread 0.19, very low bleaching. Waggoner-Gates Milling Company, Independence, Missouri—

By Judge Scarritt:

Q. These are all bleached at the mill, as I understand?

A. All bleached at the mill. In the flour 1.10; in the bread These are all the results I have before me at this .64. time.

Q. Now, with respect to whether or not your ex-351 perience was uniform or varied in the cases where you found nitrite reacting material in the flour, state whether or not it was also always found in bread or only sometimes found in bread.

A. Invariably found it in the bread.

Q. And now the methods of making bread are only the two which you have described—the Koellner method?

A. Those are the only methods we used. In this method it

was the Koellner employed flour from the mill.

Now, I am not sure whether it has been made clear-I have gotten through with the table, I think-I am not sure that it has been made clear what is meant by nitrite reacting material, nitrous nitrogen, and the various terms that have been employed to designate what may or may not be the same thing. I wish you would explain that to the jury.

A. Perhaps if I put the formulae on the blackboard.

Very good, any way, so as to make it perfectly clear if you can and do it briefly.

Peroxide is NO2, that is to say that there is one part of

nitrogen and two of the oxygen.

Now, that is the gas that Professor Shepard brought in here? A. That is the gas.

And that is the gas made by the flaming arc? Q.

The flaming [ard.] A.

- And that is what makes that electricity and conducted Q. to the flour on the motors in that country?
  - Now, nitrate of soda is NaNO2. Na stands for sodium, and NO2? Q.

Those two together, NO2. A.

- Part of the nitrous acid that condenses with the soda? Q. There we have a combination with minor substances.
- A. Now, nitrate of potassium, write that so as to illustrate it.
- Nitrate of potassium would be KNO2. Now K stands A. for potassium. Now nitrous acid, which really should come first, is that where we have hydrogen in place of 352 the sodium; the acids have hydrogen combined with

the acid.

- Nitrous acid is HNO2. A. HNO2. Q.
- Q. Brought in contact with sodium K the potassium leaves, makes it a nitrate of sodium; is that the point?
  - That is the point. A.
  - That is the chemical action? Q.

A. Now the quantities of these different elements vary, but each element has its amount, for example, nitrogen combines here in these three, combines in relative proportions of 14, 23 and 32, but these are constant proportions; these can be looked at as relative. It can thus be seen that the amount of nitrogen in these different compounds, varies with compound. Now we have in our flour we are known to have those and where you have others still, so it is impossible, not knowing the exact proportions of these two, to figure out just the per cent of nitrous acid in the flour, that may be partly combined. It is my opinion it is largely free; if we could assume that it was absolutely all free then we could calculate our results as nitrous acid, and we would have figures absolute of about 7 parts per million of nitrous acid; that I think expresses very closely to the truth.

Q. Well, I think that will be all.

A. We speak of nitrogen for the sake exactness, because

that is a more definite thing.

Q. Now something was said in cross-examination as to the manner of bleaching in the laboratory and you described that more fully so as to indicate the amount of the gas compared with the flour and the degree of dilution of the gas. I understood you to say sometimes you made it strong, and sometimes you made it stronger, and sometimes you made it weak and sometimes you made it weaker. Now I want to get the range of that so as to [to] give us the effect of varying amounts, and first of all I want you to make it perfectly plain how you did it?

A. In the last series of experiments I performed, where the amount of nitrogen peroxide used, introduced into the flour, approximately two parts per million of nitrous nitrogen, the proportion of gas to air was about as 40 to

4,000, as I remember the capacity, this is an approximation, of about 1 to 100; in other words, the peroxide was diluted twenty-five times more than that which was exhibited in this bottle. I do not give this as an exact figure, but as an approximate one. It does not take into account the air that is disseminated through the flour, the flour itself, holds a great amount.

Q. Now the color of the dilution after the gas has diffused in the air in the bottle, not when the gas was introduced, but after it had diffused in the air in the bottle, then the color

of the dilution, if it had one?

A. I did not observe it, I could not see the color after the dilution. I will say that it was again—it was difficult to make the observation because of the flour that will adhere to the sides of the flask, but it was certainly a very faint yellow if yellow at all. Q. Yes. Now what is this thing here next to me, what is the name of it? A. This apparatus?

Q. Yes.

A. That I do not happen to be familiar with that in all its details.

Q. It is not yours, it is not the kind you employed. I think, although I am not sure, whether you stated the amount of NO2 employed to bleach the flour in "Exhibit 8" according to your determination the examination was made 12 days after the bleaching, and you found 1.8 of nitric reacting material computed as nitrogen. Now what I am trying to get at is the amount of gas that was used first undiluted, and then in terms of Dr. Shepard's dilution here that was used to bleach this flour in parts of a million, or if you can tell us readily the amount in volume of such volume as Dr. Shepard brought in here that was actually used in that sack of flour?

A. According to my experiments, the amount used to bleach a flour to that extent would be approximately 20 cubic centi-

meters per kilogram of flour.

- Q. Well, I know, but how much would that be, doctor, 50 pound sack of flour in quarts, if you can tell us?
- A. That would be calculated to the 50 pound sack, about somewhere around 75 cubic centimeters I had the calculation.

Q. About how many quarts or pints?

A. That would be of the strong gas about 1/7 or 1/8 of a pint diluted.

Q. That is of the undiluted gas?

A. Of the undiluted gas. Pardon me, if I go back over again, in that calculation I have calculated the amount corresponding to that in the flour 1.8, and I think I have already given this in total; I think I have given this in total yesterday.

Q. I did not hold it in mind until I made a note or notes this morning. Is the capacity of the flour to take up gas, I believe that is the expression, used to take up the gas, limited or unlimited. What I want to know is this, how much gas would be taken up by flour and how long does it take it to do it about?

A. The flour takes up a prodigious amount of the gas; for example, they used 500 cubic centimeters per kilogram, which is greatly over-bleaching the product the gas disappeared, and the flour took up large amounts of nitrous acid, of course, there must be some limit to this. I made no special experiment to determine how complete the absorption was.

Q. In your cross-examination you said that in making this laboratory bleaching you shook it up about five minutes or kept it in the bottle for about five minutes. The amount of bleaching re-agent employed such as you customarily employ for your light bleaching, would effect a result about like the

flour seized here. How long would it take flour to absorb the gas or take up the gas, whatever the proper expression may be, in the bottle?

A. It would not take more than five minutes; probably,

very much less.

Q. But you could not approximate the time definitely?
A. Why, I don't think to get all absorbed that would.

Q. You measured the quantity introduced into the bottle, and the idea was to get that quantity into the flour to see what percentage that whole quality in the flour would be?

A. That was our idea, and also specially to make determinations comparable so far as possible, we have to have some

definite time and we want merely the comparison.

Q. For instance you put in one quantify and got it all in, you increased the quantity to double, you want to get that all in? A. So as to get some kind of a comparison.

Q. Chemical analyses, as I understand it, have among others two problems to determine, first if the known substance is

there, and next how much of it? A. Yes, sir.

Q. One is qualitative analysis and the other quantitative, as I understand it? A. Yes.

Q. How may the existence of nitrite reacting material in the flour seized here be disclosed, that is analytically; describe a test or tests if there are more than one?

A. A very convenient method of testing the flour is to slick up a dilution, take a glass plate or board, smooth it up with the flour subsidiary, and then put on that flour a drop of the so-called Griess solution, that is a solution containing several chemicals which with nitrous acid or the nitrite pro-

duces a red color; unbleached flour does not give a red color.

Q. This test bears the name Griess after the man or one

of the men who got or invented or found it out?

A. That is it.

Q. And this presence of nitrites is disclosed by the color; what is the color of this Griess solution?

A. This Griess solution is colorless or nearly colorless.

Q. Is it clear like water?

A. Clear like water, a clear solution.

Q. Since this flour in "Exhibit 8" has been brought to the court room have you taken some out of it and applied the Griess test? A. I have taken a portion from the bag.

Q. That was the bag that was shipped to your laboratory

which you brought back here?

A. The bag shipped to my laboratory and which I brought with me here and slicked it up on a plate, and added a drop of the Griess solution. In a few minutes I obtained on that flour a deep red color, perhaps as intense as the red on that label at least as striking at that.

Q. What effect will a drop of such transparent fluid have upon flour in taking nitrite reacting material as respects color

reaction, if any?

A. It gives no red color; it gives practically, it gives the same color as water would if added to the flour, a color that is recognized when moisture penetrates solid substances, no red color.

Q. Is this method that you have described a reliable quali-

tative test for nitrite reacting material in flour?

A. It is a reliable method. I have applied it many, many times to flour of known origin, and in no case has it given misleading results.

Q. Now, as to the quantitative analysis you say you found one part and eight-tenths per million; that is weight, is it?

A. Weight against weight.

Q. Parts of flour. Now, how do you get at the quantity, is that by weight or is it by some other recognized methods?

A. It is by weighing; we weigh out a certain quantity of the flour, put it into a bottle like this, then add to it a measured, carefully measured volume of distilled water.

Q. That is you weigh the flour?

A. Weigh the flour and measure the water.

Q. Now, how do you tell how much nitrogen is in it or

nitrite reacting material?

A. Shake that up, shake that up violently for five minutes is my practice, in that way causing the flour to thoroughly mix with the distilled water; then filter in order to get rid of the starch and the other matters of the flour that don't go into solution, filter through a paper, through a filter paper, porous paper, that allows the liquid to run through but keeps back the solid substances; use always a paper which has been proven to be free from contamination with nitrites; sometimes paper kept in a laboratory where

fumes are circulating will take on contamination; and after filtering we take a measured quantity of what runs

through. In our case we used two hundred cubic centimeters of water; that is about one-fifth of a quart, and after filtering we took from that filtered liquid, fifty, that is one-fourth of the amount; so whatever amount we find in that fifty multiplied by four, will give the amount that was in the whole flour used, twenty grams, in my practice, or two-thirds of an ounce. To this liquid, this clear liquid, were added a measured quantity of this Griess reagent, Griess Hosvay reagent, if one is to be examined—these are the names of men, of foreigners who devised this testing; at the same time a measured quantity of a solution containing a known amount of the nitrite is treated in the same way with the re-agent. The two

are allowed to stand side by side until they take on the maximum depth of red color. If pure water were used no color would appear at all. If an unbleached flour were used no color would appear at all in the liquid; but the bleached flour, and with the standard dilution used for comparison, a red color appears, more or less intense, varying to deepest or deep red, a red which might be compared to that of red ink or red liquor. By comparison of these two tubes, or others that we know the standard, one learns the amount of the nitrite nitrous nitrogen in the flour in a quantitative way.

Q. So, then, the color measures the amount, measures the

weight?

A. The color measures the amount, and we have standards

of color that serve for comparison.

Q. Is that a recognized way that is recognized by good chemists on the subject as a proper method to find out how much of nitrite re-acting material is in a given substance like flour or anything else?

A. It is a recognized method that is used all over the world

for the determination of nitrites.

Q. And for the determination of the weight, color, measurement?

A. In a quantitative way.
 Q. I think that is all.

## 358 Recross Examination

By Mr. Smith:

Q. In giving Mr. Butler your figures on the amount of nitrites which you found in the bread you read from a statement, didn't you, or took your figures from a statement?

A. From that table.

Q. The table I have in my hand; that is prepared by you?

A. That was prepared by me.

Q. And these observations in it here are made by you and under your personal examination? A. Yes, sir.

Q. Now all of the flours you referred to here were bleached in the mill, were they? A. In the table, yes, sir.

Q. In this table?

A. Yes, sir, they were all bleached in the mill.

Q. You collected samples of bleached and unbleached flour?

A. Yes, sir.

Q. And then you made tests of the bleached and unbleached flours for the purpose of determining a great many different things, all of which you noted on this?

A. Quite an extensive examination.

Q. The notations you made here are accurate?

A. Yes, sir.

Q. Made by you personally? A. Checked by me personally.

So that you have personal knowledge of these facts that Q. are indicated on this exhibit? A. It is.

Q. Then you caused some bread to be baked? A. Yes, sir.

Q. And you made examinations of the bread afterwards?

A. Yes, sir.

Now, was I correct yesterday in understanding you to say that in bleached flour the acidity was increased or diminished?

A. Increased.

The acidity in bleached flour is increased. Now, in making this test you examined these flours for the purpose of determining their acidity, did you?

A. We determined the acidity, yes, sir.

Now I call your attention to the first one you have got there, the Updike Milling Company, Omaha? A. Yes, sir.

Q. Under the head of unbleached flour you have acidity

given as .045, haven't you? A. Yes, sir.

Q. And the bleached flour is identically the same, isn't it? A. Yes, sir.

No increase of acidity there? 359

A. None brought out by the determination.

All right, all right, and you were examining these flours to determine the acidity, weren't you, among other things?

A. We were making the determinations and studying the results afterwards.

Q. Well, you made them accurately?

A. Oh, we made them as accurately as we could do it, but

I will say-

O. All right, don't explain too much, you will do that later on, but your examination of the Updike flour, both bleached and unbleached did not disclose to you a particle of difference in acidity, did it?

Mr. Butler: Wait a moment. I state to the court I think it would save our time in a matter of this sort if the witness would be permitted to explain his answer.

The Court: Perhaps you better wait till you re-examine him.

By Mr. Smith:

Q. Now, I call you attention to the next one, Conrad-Heisel, Plattsmouth, Nebraska. There you had samples of bleached and unbleached, didn't you?

A. That notation was not read.

Answer my question, but I am going to read it. You had samples of his flour both bleached and unbleached?

A. I had samples of the flour.

Q. Now, in your examination of the acidity of that, didn't it show of the unbleached .112, and of the bleached .085. That was not increased, was it? A. No, sir.

Q. Decreased, wasn't it? Answer the question, it was de-

creased, wasn't it? A. No, sir, not by-

Judge Scarritt: Repeat that please, you used the same term in both.

By Mr. Smith:

Q. In the unbleached flour the acidity, as shown by this memorandum you have was .112? A. Yes, sir.

Q. And in the blenched flour it was .085?

A. No, sir; the result-

360 Q. And in the next one, the Fremont Milling Company, the unbleached flour showed acidity .040, didn't it?

A. Yes, sir.

Q. In the bleached .031, wasn't it?

A. Those are the results.

Q. That is a decrease instead of an increase, isn't it? Answer the question.

A. I could not answer it in that form. It is a lower result.

Q. All right. A. If you put it that way.

Q. And the next was a sample from the Fremont Milling Company in which the unbleached showed an acidity of .148, and the bleached an acidity of .130, didn't it? A. Yes, sir.

Q. That was not an increase, was it?

A. It was a lower figure.

Q. Yes, sir, yes, sir, a lower figure. The next one was the Brown Milling Company, where the unbleached showed an acidity of .067 and the bleached showed an acidity of .067, just the same, wasn't it? A. Yes, sir.

Q. Neither an increase or decrease by that bleaching, was

there? A. Both the same results obtained in that case.

Q. The next one you have, Wells-Abbott-Nieman Company of Schuyler, Nebraska, where the unbleached flour showed an acidity of .071, and the bleached showed an acidity of .067; is that right? A. These are the figures.

Q. No increase there in acidity, was there? Just answer the

question, please. A. I can't-

Q. You can't answer? A. I do not call it an increase.

- Q. No, I don't think anybody would. The next is J. H. Snell, of Ashland, Nebraska, his unbleached flour showed an acidity of .040, and the bleached shows an acidity of .040, didn't it?
  - A. The results as there stated are the same in both cases.
  - Q. They are the same. The next is from the Southwestern

Milling Company of Kansas City, the unbleached showed an acidity of .108? A. Yes.

Q. And the bleached showed .108, didn't it? A. Yes, sir.

Q. No increase, was there?

A. The same results recorded in both cases.

Q. Weren't you endeavoring to record the accurate results?

A. As accurate as that method would give.

Q. Yes, sir, well, were you using an old second-hand method?

A. Using the very best method we could find for that pur-

pose.

Q. I suppose so, yes, sir. The next is August J. Bulte Milling Company, Kansas City. The acidity shown of the unbleached is .121 and the bleached .133; that is an increase, isn't it?

A. The result is slightly higher in the second case; I don't

know as it is an increase.

- Q. Where your record shows an increase in acidity, is that true? A. I don't think it is true, put in that form.
- Q. Well, it is the first one, this memorandum you prepared, which shows an increase, isn't it?—Yes or no, please.

A. I don't think it shows an increase.

Q. All right, all right; we'll try and let the jury see the figures. The next is some other milling company in Kansas City, where the unbleached showed an acidity of .112 and the bleached an acidity of .108; isn't that right according to your figures? A. Yes, sir.

Q. The Shawnee Milling Company, Topeka, Kansas, where the unbleached shows an acidity .112, and the bleached an

acidity of .112, exactly the same, aren't they?

A. Those are the same figures.

- Q. Now, coming down to the Waggoner-Gates Milling Company, at Independence, Missouri,—the next is some milling company here in Kansas City; you had a number of samples from them, didn't you? A. Yes, sir.
  - Q. The unbleached showed an acidity of .103, didn't it?

A. Yes, sir.

Q. .103? A. Yes, sir.

Q. And the bleached exactly the same, wasn't it?

A. The same figures recorded.

- Q. And the next the unbleached shows an acidity of .099?
  A. Yes, sir.
- 362 Q. And the unbleached an acidity—the bleached an acidity of .102; that is a slight increase, isn't it?
  - A. Higher, the returns are higher in the second case.
  - Q. The next one, from that same milling company here,

showed an acidity of .103, unbleached; and the bleached .103, just exactly the same? A. The same results.

2. You obtained these results, didn't you? A. Yes, sir.

Q. And recorded them? A. Oh, yes.

Q. And thought they were accurate when you put them down, didn't you?

A. As accurate as the method would give.

Q. All right. Then you had some from the Waggoner-Gates Milling Company, Independence, Missouri; the unbleached in that case shows an acidity of .094, didn't it? A. Yes, sir.

Q. And the bleached showed exactly the same, didn't it?

A. Yes, sir.

Q. And you had another sample from them, where the unbleached showed exactly the same, namely, .094 and the bleached exactly the same, .094. Now in that whole record you made there there is just two which showed a slight increase, isn't there; I have not counted them, but there are some that show an increase, I read them correctly?

A. You read them correctly.

Q. Now, after you had taken these several samples you made bread out of them, didn't you? A. Yes, sir.

Q. And you examined the bread afterwards for the purpose of finding the nitrite contained in both the bleached and the

unbleached, didn't you? A. Yes.

Q. Now, I call your attention to the bread which you made from unbleached flour which you obtained from Plattsmouth, Nebraska, and ask you if it is not true that according to your determination the bread which you baked from the unbleached flour showed a re-action for the nitrite?

A. That was not bleached from the Alsop process.

Q. I say it is not, the unbleached showed a reaction for nitrites there, the unbleached?

A. We put it unbleached, but it was not unbleached.

Q. You have recorded it as unbleached.

A. It had not been through the machine for the bleaching, but it was taken in a mill contaminated with the bleaching gases, and therefore had acquired accidentally the bleaching. It is a thing that almost invariably happens when flour is stored in a mill where bleaching is carried out.

Q. But in all of these cases where you have recorded them as unbleached, you mean that none of that flour has gone through the agitator, through which the bleached flour goes,

don't you?

A. I mean it was not intentionally bleached, but we found it practically impossible, in many cases to get the unbleached flour from mills where a generator was in operation, without having it in a degree bleached. The proof of that was absolute; there is no question about it, whatever, and so the so-

called unbleached there is not fair for comparison with the other.

Q. Well, you made this tabulation, didn't you?

A. We made the tabulation and we recorded every result that we got, and it is necessary to make this explanation.

Q. Well, all right. A. In order to show the fact.

Q. And this flour, making comparisons between what you denominate bleached and unbleached flour, didn't you?

A. We denominate them bleached and unbleached, it needs

an explanation.

Q. It requires an explanation?

A. It requires explanation.

Q. Well, I think that is all right. Now, referring to the Fremont Milling Company, and the flour which you have denominated unbleached, after you made bread out of that, you round, .47 as sodium or as nitrite nitrogen contained in that bread, didn't you?

A. Yes, sir, but the results obtained on the flour show that the flour had been bleached, whether by accident or de-

sign.

. Well, when you were making your tabulations why

didn't you get unbleached flour?

A. We did the best we could to get them, but we did 364 not have the mills under our control, and were obliged

to depend on the courtesy of mill owners; it is a difficult matter, and we hope later to equip a mill for ourselves, and make this bleaching under conditions, so we may be absolutely sure that the unbleached flour was so in fact, but we were unable to secure, to purchase it to perform these experiments.

Q. Yes, sir. Next as to the Fremont Milling Company, now unbleached flour, when you baked that into bread and examined it for nitrites you found it showed nitrite contents of 1.54, didn't

you? A. Yes, sir.

Q. And in your tabulation here-

A. So-called unbleached.

Q. Well you don't mark it as so-called unbleached, do you; you mark it as so-called unbleached, do you; you mark it unbleached, don't you?

A. We mark it unbleached, but that is to be explained as

not being intentional bleaching.

Q. Yes, and coming now to that which is obtained from the Shawnee Milling Company under the head of unbleached, when you baked that into bread you found nitrogen re-action as indicated by .59, haven't you?

A. That is true, it was marked unbleached, and it was the best we could obtain from that mill, but analysis of the flour

showed that, in fact, the flour was not unbleached, it had been accidentally bleached.

Q. When did you make this tabulation of figures here?

A. About two years ago.

Q. About two years ago? A. More or less.

Q. You have had this in your possession ever since?

A. Yes, sir.

Q. And you have had occasion to refer to it at different times? A. Oh, occasionally.

Q. I see. Now, do you have any objections to its being

marked as an exhibit and offered in evidence here?

A. Counsel has the decision on that.

Mr. Butler: All right.

The table referred to was thereupon marked by the stenographer "Defendant's Exhibit 204".

365 Witness: I would say that I would like to check any clerical errors. I have another copy here, a typewritten copy; we can supply you with that if you could leave me this original.

Mr. Smith: We will offer this in evidence, and then later on we will compare and substitute the copy.

The Court: It will be admitted subject to corrections.

Mr. Smith: That is it, it is offered in evidence.

Mr. Butler: The other side had a copy of this for the last two years. Mr. Elliott has a copy of it.

Witness: Allow me to keep this original and compare it with one of the typewritten copies, I have other notes on this table.

Mr. Smith: This will be returned.

Witness: I have a kind of an index on this.

Mr. Smith: We offer in evidence Exhibit 204 as part of the cross-examination.

The Court: It will be admitted.

Witness: I will say that that contains notations purely for my own information, index and one thing and another, appearing on the table.

Mr. Smith: I am perfectly willing that a copy should be substituted.

Q. Now in making this baking, or in baking this bread, what kind of an oven did you use?

A. A portable oven, electric oven.

Q. How is it heated? A. By electricity.

Q. Well referring, now, to these bread making experiments that you testified to, was that bread all baked on the same day, I mean what you tested, that is what I am referring to?

. Why, the comparative tests were made, yes, sir, they

were made on the same day.

Q. Well how many different kinds of flour did you bake

into bread on the same day?

A. Oh, as a rule only one or two, possibly three or four; took pains not to have mixed different lots in the oven.
 Q. I say when you came to the stage where you did the testing how many did you test in one day?

A. As a usual thing only tested one or two, I mean

comparison, made one or two comparisons of it.

Q. Now, referring to this Griess test that you referred to, how minute particles will this test determine or detect? It is an exceedingly delicate test, isn't it?

A. It is a delicate test.

Q. The most delicate known to chemistry, isn't it?

A. Oh, I wouldn't say that.

Q. What is there that is equal to it in detecting nitrites?

A. In detecting nitrites it is probably the most delicate test, but then there are—

Q. And it would detect them in what minute quantities?

A. Oh, it would detect on much smaller quantities than given in this flour; I would not want to say the exact limit; it is used a great deal in water analysis.

Q. In this case we have got one of a fraction per million. Now, have you got it down to a point where it would—oh, a quarter of a part per million, it would detect that, wouldn't it?

A. It would detect that under favorable conditions; it might be in a substance where we would get a clear liquid, or something of that kind, but it would.

Q. Do you know what would be the weight of a quart of that gas you have denominated as NO2 on the blackboard?

A. I don't know whether I have this calculated; but I could calculate it.

Q. You can't give it now? A. I may find it here.

Q. Well, if you don't remember let it go. A. A quart?

Q. If you don't know, Professor, let it go.

A. I think I could give it to you.

Q. Well, all right, if you can give it what is the weight of it? A. A quart of nitrogen peroxide?

Q. Yes, or the gas NO2, I don't know whether it is nitro-

gen peroxide.

A. That would weigh for a quart approximately 1/15 of

an ounce, a quart of it would weigh.

Q. I want to call your attention to this publication that has been marked "Defendant's Exhibit 205", issued by the United States Department of Agriculture, Division of Chemistry, Foods and Food Adulterants. Investigations made under direction of H. W. Wiley Chief Chemist, with the collaboration of K. P. McElroy, W. H. Krug, T. O. Trescot, W. D. Bigelow, and others. Are you familiar with that?

A I am

Q. I call your attention to page 1264 of that, reading as follows, I call your attention to the following language on page 1264, and ask you if you agree with what the Department of Agriculture said about this, "A high grade American patent flour, has, approximately, the following composition: Then moisture, proteids, and so forth, ash .50." You agree with that?

A. At the present time I would not agree that that was the highest grade of flour or that it was a patent. I don't

know what the practices were at that time.

Q. Do you agree with the Department of Agriculture and Dr. Wiley and Mr. Bigelow and others that a high grade American patent flour has, approximately, in ash, .50?

A. I don't think it has at the present time.

Q. I see. Well, do you think it did have in the year of Our Lord, 1898?

A. I had no observations made from that year.

Q. Is this W. D. Bigelow whose name appears upon this and which I read, the same one of those whom you sent one sack of this flour?

A. I don't know whether I sent it to him; I sent it to Wash-

ington to the Bureau at Washington.

- Q. Well, do you know of any bulletin—this is referred to as Bulletin No. 13, do you know of any bulletin issued by the department at Washington under the head of "Food and Food Adulterants by H. W. Wiley, chief chemist, W. D. Bigelow and others, which has in any wise reduced the ash content of a high grade of American patent flour since its publication?
- A. I do not quite understand what you mean by reduced.
  Q. Well, this .50, if you have reduced it to .40 I want
  to see what is the authority for the reduction.

A. Common experience.

Q. Your common experience?

A. Yes, and experience gained by talking with other flour

experts all over the country.

Q. I see. You think that with the improved machinery and improved flours and improved skill, that the method as

acquired since the year 1898, or twelve years ago, that the ash now obtained from flour is less than it was then?

A. I don't say so; I don't know anything about the mill

conditions at that time.

Q. Do you now?

- A. Not as a miller, I don't pose as a practical miller.
- I believe that is all.

## Redirect Examination

By Mr. Butler:

Q. Now, referring to the table 204 in your testimony, either direct or first cross, you stated, as I understood you, and as you appear to have been understood by the gentlemen on the other [-] that acidity in flour was increased by treating

it with the Alsop process? A. Yes, sir.

Q. On cross-examination your attention was called to a paper marked Exhibit 204, to certain statements thereon, showing acidity of bleached flour and of unbleached flour. In some instances, most, I think it appears most, called attention to, at any rate by Mr. Smith, it appears that the acidity was less in the case of the bleached flour, in a number of cases, than it was in the unbleached flour?

A. Very slightly, yes, for the most part within the limits

of experimental error.

Q. What is meant by that as a phrase? Mr. Elliott used at one time in the cross-examination of Dr. Shepard the phrase "within the limits of experimental error." What does that mean?

A. It means this, that such a thing as absolute accuracy in chemical science cannot exist; there is always an experimental error. If we weigh out a certain quantity of a material, our weight will not be absolutely and mathematically the amount we are working for. Of course, with delicate bal-

ances we can get more closely to the true fact, but we have never been able in any observation of weight or 369 measure to gain absolute accuracy. We may have a ruler, which is based on a careful standard, but vet by means of a microscope one could find that that was not and could not be absolute perfection. So, in every process we are obliged to allow a certain range for error, especially with analytical processes. Now, we have some methods that will give us results that are accurate only to within one-half a per cent; other methods that will give us results accurate within two-tenths of a per cent, one-tenth of a per cent, and so on Taking these two specific methods the determination of acidity in flour by the method there outlined, and the determination of nitrous nitrogen, we have in one case, the case of the determination of acidity, a method that is, as we use it, that would be called quite accurate, quite accurate; it should give results at the most within a few hundredths of a per cent: but when we have the Griess test, we are dealing with a more accurate method and a method which we were obliged to use in making these determinations of nitrous nitrogen. Now, I will say the comparisons of acidity in that table as determined by that method throw no light whatever on that increase in acidity as due to nitrous acid, for the reason that the method is not delicate enough on the one hand, and second, because the method of taking samples in the mill was not as accurate as we employed in our laboratory. If I may be allowed to explain that latter point a little more in detail I will say that these samples were taken in the ordinary process of milling. We could not ask the miller, and they were always very courteous, to shut down his mill and give ns absolute control; and so we took the sample as best we could from the stream unbleached; when I say unbleached, you understand, I mean not intentionally bleached, before it got to the bleacher, although it may have been contaminated with the bleaching gas. Then later on after the inspector, or whoever took the sample, came down, perhaps several stories to the place where the flour was coming out, he took another sample, or we took another sample of the stream after

370 bleaching. Now, it was a part of the same flour before and after bleaching, but from the stream it may have changed somewhat in composition. In our laboratory we take the whole quantity of flour, put it on a paper, and mix it for fifteen minutes, in order that we might be sure that our two portions of flour, that unbleached and bleached, would be absolutely the same as near as was possible to make it, we could get naturally closer results, so we are working in this case with a method that was not perfect in sampling the flour, and second, we were working with a method that is not sufficiently accurate to bring out this increase in acidity that was brought out by deduction.

Q. The limits of experimental error then I take it from your explanation, they are with respect to different chemical

tests or operations, is that true?

A. Oh, very, very greatly, sir, greatly.

Q. Now, I would like to ask you to give to the court and jury the basis for your conclusion that the bleaching of flour by the Alsop process increases acidity in the flour, and that there may be no misunderstanding, you may tell what acidity you referred to if there be two kinds or different kinds of acidity.

Q. In other words, I want the foundation for the opinion that you have expressed, that acidity is increased by this

process.

A. The acidity of natural flour is a natural acidity, usually attributed to the organic acid, lactic acid, the acid which forms in souring the milk from the sugar of the milk, so that can form in the flour from a very small quantity of sugar present in the flour; it is a harmless acid, in fact a benefit that is much sought after by many for human foods; those who drink buttermilk, for example, get the acidity. The acidity brought about by bleaching is that of nitrous and nitric acids, two acids, two acids of very great power, nitric acid dissolving metals and corroding the skin, burning holes in clothes, and so on, and the nitrous acid having also—

Judge Scarritt: If Your Honor please, in the interest of time I object to this because it was all gone over 371 in his direct examination.

The Court: Yes, he went over that subject matter.

By Mr. Butler:

Q. Now, I wanted the foundation for your opinion. You have explained to us sufficiently, both on direct and cross-examination, the difference in these two kinds of acidity. Now, I want the foundation for you opinion that the bleaching of flour by the Alsop process increases acidity.

Judge Scarritt: We would make the same objection, because he stated that as a qualification for the testimony that he introduced on his direct examination.

Mr. Butler: I think the Judge is in error about that.

The Court: I understand, but as he does, I think that is plain.

Mr. Butler: I am not quite sure that I—I am very sure that it was not completely covered.

The Court: Well, we conceive, you must, we are getting along awfully slow. We must not get into a contest of who has the last word with the witness. Of course all you gentlemen are aware, or [worse] when I was practicing law, every lawyer wants the last word, but in this case I think I will take the last word.

Mr. Butler: Your Honor will remember on this specific point, I have no doubt that if ask permission of the court that the witness may explain this very matter.

The Court: When a lawyer says that by oversight he has passed something by, of course the court always takes a

lawyer at his word and allows him to go into it. In this case Mr. Smith examined this witness from the table, and the witness was somewhat insistent upon the right to explain; Mr. Smith was equally or more insistent that he should not explain. Now, then, Mr. Butler is having him make the explanation, that ends it. Now, gentlemen of the jury we are going to adjourn until Monday morning.

372 At this point the further hearing of this cause was adjourned until Monday morning June 6, 1910, at 10 o'clock A. M.

Pursuant to adjournment, court met at nine o'clock a. m., Monday, June 6, 1910, and the trial of said cause proceeded as follows:

Mr. Butler: On the cross-examination of the witness, A. L. Winton, Mr. Smith called his attention, and introduced in evidence, a statement, on Page 1264, of a publication of the United States Department of Agriculture, Division of Chemistry, foods and food adulterants, investigations made under the directions of H. W. Wiley, Chief Chemist, with the collaboration of K. P. McElroy, and W. H. Crow, T. C. Tresty, W. B. Bigelow, and others. The statement so introduced, was as follows: "High grade patent flour. High grade American flour has approximately the following compositions. Among the things enumerated, as ash, expressed in percentage, 0.05." In connection with that evidence, the government offers in evidence, from the statements made in connection with that offer, and the data referred to in such statement, upon which the conclusion is based, and said to be based, as follows: "From a careful study of the foregoing data, it is possible to arrive at a correct idea of the composition of typical American flour, of the classes indicated above." Then, follows the statement. Now, the "foregoing data" referred to, or some of them, at any rate, are found on Page 1254 of the same publication, under the caption "Class One, composition of patents, wheat flours". Then follows a long list of samples of

flour, designated by laboratory numbers, and a statement of the percentage of ash in each sample. We offer in evidence that table, together, with the numbers of

each sample, in so far as respect the ash content.

Mr. Smith: I believe there is no objection.

The Court: Well.

Mr. Smith: All of that part, is offered, that appears on Page 1254, showing the ash content.

Mr. Butler: Yes, Yes, every one relating to ash content.

Mr. Smith: Yes.

Mr. Butler: And this table is the data referred to.

Mr. Smith: All right. No objection.

Mr. Butler: And the average of the samples, as shown by the table, is 0.44, and it includes a sample numbered 12,549. The average is based upon, in part, and includes a sample known as 12,549.

Mr. Smith: Now, pardon me. Your offer takes in all of that page, so far as it applies to the ash in patent flour. Am I right?

Mr. Butler: Yes, and the sample numbers.

Mr. Smith: I have no objection to that part going in. Everything.

Mr. Butler: On page 1241, this sample, 12549, is described, giving the name of the manufacturer. It was made in Guatemala. It would not appear to be an American flour at all. The ash content in that particular flour was very high, and, therefore, increases the average, being 0.89. And in connection with each of the laboratory numbers, we offer in evidence the decription of each number, as contained in the same bulletin, commencing on Page 1238.

Mr. Scarritt: What is the lowest number, there, Mr. Butler?

Mr. Butler: In the detail?

374 Mr. Scarritt: The highest was 89. What is the lowest?

Mr. Butler: The first one I see is 37. I will read them all—the ash content. 0.37, 0.39, 0.45, 0.45, 0.36, 0.42, 0.43, 0.33, 0.43, 0.40, 0.37, 0.37, 0.50, 0.49, 0.45, 0.40, 0.49, 0.47, 0.48, 0.40, 0.39, 0.46, 0.48, 0.47, 0.39, 0.41, 0.38, 0.41, 0.51, 0.46, 0.89. That is Sample Number 12-549—The Gautemala flour.

Mr. Scarritt: 33 is the lowest?

Mr. Butler: I am not through, yet, (continuing) 0.38, 0.44, 0.59. The number of that sample is, 12926, and the description does not indicate that it was a patent flour. 0.44, 0.42, 0.41, 0.59, which is Sample Number 15,961. 0.53, and 0.48, making an average of 0.44.

Mr. Scarritt: 33 is the lowest?

Mr. Butler: I think 33 is the lowest, Judge.

Mr. Scarritt: And 89 is the highest.

Mr. Butler: And, of the same report, on Page 1227, a part of the tables commencing on Page 1226, and extending over Page 1227. Under the caption "Analysis of the product of roller milling", and, under the caption "Finished flour", the ash content is indicated for various grades of flour, namely, baker's, patent, and low grade.

Mr. Smith: I object to this, Your Honor, as incompetent, irrelevant and immaterial, it being what purports to be an analysis made by some person, of some particular flour, what, we don't know, and here he is pretending to give his conclusions. It is incompetent, irrelevant and immaterial, as being hearsay testimony and no proper foundation has been laid, and not having had chance to cross-examine the man who made these particular figures.

The Court: The same publication?

375 Mr. Butler: Yes, and relates to ash.

Mr. Scarritt: Don't relate to this flour, though. It relates to baker's patent flour.

Mr. Smith: Three grades.

Mr. Butler: Oh, no, you misunderstood it. There is a grade known as baker's grade, and patent, as well. That is a subject touching which Mr. Smith offered evidence out of this book, and then the low grade?

Mr. Scarritt: Are you offering the patent grade?

Mr. Butler: I am offering the three, to show the relation.

Mr. Scarritt: We object to the three.

The Court: Objection is overruled.

Mr. Scarritt: We save an exception.

Mr. Butler: The ash content, as indicated, is as follows, under the sub-caption "Finished Flour", baker's 0.62, patent, 0.39, low grade, 1.99.

Mr. Scarritt: Does that show the kind of wheat?

Mr. Smith: No.

Mr. Scarritt: We object to this, further, if Your Honor please, because it does not show the kind of wheat that the samples were taken from.

The Court: Objection overruled.

Mr. Scarritt: Exception.

Andrew S. Mitchell, called as a witness on behalf of the government, being first duly sworn, testified as follows:

## Direct Examination

By Mr. Butler:

Q. Dr. Mitchell-

A. (Interrupting) Mr. Mitchell, please, Mr. Butler.

Mr. Mitchell, what is your profession? Q. 376

I am a chemist, and pharmacist, by training, and a chemist by profession.

Q. And your employment?

A. I am now chief of the St. Paul laboratory of the Bureau of Chemistry of the United States Department of Agriculture.

Q. And your work, has to do with the examination of foods?

A. It does.

Q. How long have you had to do with that kind of work,

whether for the government of elsewhere?

A. More or less, since 1888, and exclusively, for eight years -practically exclusively for eight years, before entering this service, about since two years ago last July, in the federal service.

Mr. Scarritt: I didn't catch the employment-where it was.

Mr. Butler: He is in charge of the laboratory of the Bureau of Chemistry, of the Department of Agriculture, at St. Paul.

The Court: St. Paul?

The Witness: St. Paul, Minnesota.

Mr. Butler: His position corresponds to that of Dr. Winton, at Chicago.

Q. Before you were employed by the government, what was your employment, with respect to this character of work?

I was, for nearly eight years, the state chemist of the Dairy and Food Commission, State of Wisconsin, and the chemist of the State Board of Health. I taught chemistry before that, in Milwaukee high school-physics-to some extent, and, five years, or a number of years— I think five years, I was professor of chemistry and toxicology in the Milwaukee Medical College and School of Dentistry.

Q. Did you receive the flour contained in the government's Exhibit 9, same being a sack which was testified by the inspector Daniel M. Walsh, to have been sent to you from the place

of seizure, here in Castle, or Greencastle, in the State of

Missouri? 377

A. I did. I didn't hear Mr. Walsh's testimony, but I received the flour.

Q. That was his testimony. When did you receive that sack of flour? A. On April 13, 1910.

Q. Was it under seal? A. It was.

Q. Under the seal of the department, with Mr. Walsh's signature?

A. Mr. Walsh's signature, and the date, April 11, 1910. It

came by the Adams Express Company.

Q. Did you analyze, or make examination of some of the flour in that sack? A. I did.

Q. You may tell the jury what you found.

A. I found 2.3 parts of nitrogen, as nitrites, per million, in this flour. That is computed as nitrogen peroxide, and 7.5 parts per million, as NO2. I found an ash content in this flour of .53 of one per cent.

Mr. Smith: How was that?

Mr. Butler: .53.

A. (Continuing) .53 of one per cent.

Mr. Butler: Have you got it, Mr. Smith?

Mr. Smith: Yes. The Witness: .53.

Mr. Smith: Yes. I thought you said 5.3.

The Witness: If I did, I reversed my terms.

Mr. Smith: All right, I understand, Doctor.

By Mr. Butler:

Q. Are you familiar with the method of examination for nitrite reacting material, which is employed by Professor Winton? A. I am.

Q. Do you sometimes employ the same method?

A. I do. I generally do for control and comparative purposes.

Q. Now, the amount he found in the sack shipped to him was 1.8 parts per million? A. Yes, sir.

378 Q. Computed as nitrogen? A. Yes, sir.

Q. And you found 2.3 parts per million, computed as nitrogen? A. Yes, by a slightly modified method.

Q. Did you make an examination and analysis of the flour, by the same method that Professor Winton employed.

A. Very similar method.

Q. Did you examine by two different methods?

A. I did.

Q. Did you get the same result by two different methods?

A. No. I got 1.6 by a method very similar to what Dr.

Winton used. No two men work just exactly alike, I think.

2.3 by the method-

(Interrupting) By the method upon which I relied. A. The test was the Griess-Ilosvoy reagent, was it?

Q. A. Final—the comparison of the colors by that test.

Q. I mean final. A. Yes, sir.

Q. Did you make an examination of the flour, itself, to determine its quality and grade?

A. Such an examination-

- Q. (Interrupting) Other than chemical analysis, I mean. Such an examination was made by Mr. Bailey, yes.
- A. Q. Have you given any particular or special study to the effect of bleaching flour by nitrogen peroxide gas, mixed with air? A. I have.

Q. And during what period of time?

Well, the experiments were conducted mainly at the I have made examinations of time, about two years ago. very many bleached flours since, but not for purposes of investigation, so much as to see whether or not they were so treated.

Q. Has your examination and study of this matter enabled you to determine whether or not the treatment of flour by this process adds to or imparts to or mixes with the flour any sub-

stance? A. I have. It does,

Q. What is the fact in that regard? It does mix with it substances.

A. What substances? Q.

A. It mixes with it nitrogen peroxide. This enters the flour in various forms.

379 And in analysis it is disclosed as a nitrite reacting material, as has been heretofore described. I take it.

It does. A.

Q. Have you been able to ascertain whether or not it has any effect upon the quality or strength of the flour?

A. It has.

Mr. Scarritt: We object to that as a conclusion, if your Honor please.

Mr. Butler: This is intended to be merely preliminary, by way of qualification.

Mr. Scarritt: We don't want a conclusion, as preliminary qualification. The subject of inquiry is, as to what happened when he made these examinations and these tests, and not what effect it had, in his opinion, on the strength or quality of the flour. That is for the jury to decide. We object to it for that reason.

The Court: You may answer.

The Witness: Read the question.

(Question read)

A. I have.

By Mr. Butler:

Q. What is the fact in that regard?

Mr. Scarritt: Same objection.

The Court: You may answer.

Mr. Scarritt: Same objection.

A. I did not catch the question.

By Mr. Butler:

Q. What is the fact in that regard? What effect does it have upon the quality or strength of the flour?

A. It injures the quality and strength of flour.

Q. Now, how?

Mr. Scarritt: Now, wait a minute. We ask that that be stricken out, for the reasons given in the objection to the question.

The Court: The answer may stand.

380 Mr. Scarritt: Save an exception.

(Question read)

By Mr. Butler:

Q. How, and in what respects, I intended to ask you.

A. It injures, first, the flavor of the flour.

Mr. Smith: Wait. I move to strike that out, as incompetent, irrelevant and immaterial, and being merely the conclusion of the witness, on what is or is not the right sort of a flavor. I think that comes squarely within the ruling of Your Honor last week.

Mr. Butler: I don't think so.

The Court: The answer may stand.

Mr. Smith: Save an exception.

By Mr. Butler:

Q. Now, what other respect, if any?

A. It alters the physical and chemical properties of the food of the flour. In introduces mineral acidity into the flour. It affects the quality and strength of the gluten, in degree as the bleaching exists.

Q. What effect upon the gluten?

A. It affects the color of the gluten. It weakens its relative strength,

Q. How does it affect the color?

A. It changes its normal bright yellow color, to browns,—various shades of browns, and finally to blues, and grays, in some instances, where the bleaching is rather excessive.

Q. And how weakens the strength of the gluten? What

do you mean by the strength? In what particular?

A. Its toughness and elasticity.

Q. You spoke of its injury to the fat. A. I did.

Q. Or, that it affected the fat. In what way, and how?

A. It affects the fat, first, to destroy its natural goldenyellow color. It renders it more or less solid—or, more solid. Not more or less, but more solid in consistency. It entirely changes its smell and taste. It alters its iodine num-381 ber.

Q. What is the iodine number?

A. The iodine number means, merely the weight of iodine which is absorbed by a given weight of fat, under certain conditions, in percentage. It will absorb less iodine, in percentage, than it would before being bleached.

By Mr. Butler:

Q. That is, fat of flour unbleached will absorb a certain amount of iodine?

A. Yes, sir, and after bleaching it will absorb less,

Q. Are you familiar with the flour known as "patent flour" in commerce and in the market? A. I am.

Q. What is a patent flour?

A. Patent flour is flour made from the better portions of the wheat kernel, by means of the gradual reduction process. It consists of those streams of flour which are composed of the inner portions of the wheat berry—the white berry—and commingled with such other streams as may form in the reduction, which are free from the outer coats, and which are free from dirt. It is middlings, ground.

Q. What is a clear flour?

A. A clear flour is the flour which is obtained in the manufacture of patent flour—the rest of the edible flour.

Q. What is that? A. The rest of the edible flour.

Q. After the patent is taken out?A. After the patent is taken out.

Q. The clear is one of the remnants, or by-products?

A. Not remnants. It is one of the contents. It is formed at the same time.

Q. It is the rest of the flour?

A. The rest of the edible flour.

Q. What is a straight flour?

A. A straight flour is all of the edible flour—it is clear and the patent mixed together.

Q. And baker's grade?

382 A. Baker's grade is not a very definite grade. It may be a very high clear. It is generally very high clear—

approximately a straight-certain streams taken out.

Q. Now, as respects the quality of freshly milled flour, as compared with the same flour, all being unbleached, that has been aged or conditioned by storage—any difference in quality,—that is in the color, or flavor, or characteristics if any, and if so what? A. There is.

Q. Describe the difference.

A. The aging or conditioning of flour under proper conditions develops a certain quality in the gluten, which is known as strength. It also develops the flavor to some extent, and it incidentally lightens the color and will lighten the color of the bread, incidentally, that is made from it.

Q. What effect upon the color of freshly milled flour does

bleaching, by the Alsop process, have?

A. It lightens the color of one constituent of the flour. It lightens the color of the flour, as a whole. Particularly the fat—the color of the fat.

Q. And as to the degree of bleaching, or lightening of the flour. Does that depend upon the amount of bleaching, or

the amount of treatment by nitrogen peroxide gas?

A. It does, so far as the bleaching has to do with the color of the fat, and it depends also upon the time of standing. The bleaching goes on. There is an instantaneous bleaching in the Alsop, or similar processes, due to the immediate action of the gas. Then, there is a continuous action which goes on, which makes the flour still lighten considerably, on standing.

Q. That is, the more bleached, the lighter it gets up to

a certain point?

A. Up to a certain point, until the fat is wholly white.

Q. As respects the amount of nitrite reacting material which is recoverable from the flour, how does that compare with the amount of nitrogen peroxide gas employed in treating the flour?

A. Well, it is very much less. It, in my method of working, if the work is done upon a flour that is fresh-

ly bleached,—by that I mean if I get hold of flour not more than one or two weeks, I can recover, under favorable—under usual conditions, under the first two weeks, I can recover approximately twenty per cent of it. That is, if there is forty parts, by weight, of the gas used in the bleaching, I can recover eight parts as gas—computed as gas.

Q. Expressed in the same terms?

A. Expressed in the same terms, as nitrogen peroxide.

Q. Which, expressed in nitrogen, would be about one-fourth?

A Would be about less than one-third, I think—divided by 3.3, approximately—3.28.

Q. About one-third, then? Have you made any studies and examination to ascertain whether or not bread made from bleached flour, according to methods ordinarily employed in the making of bread for consumption, whether nitrites or nitrite reacting material, remains in the bread?

A. I have, some that have bearing on that.

Q. What is the fact in that regard?

A. If they are made by a method which I shall designate as the Koellner method, they retain about thirty-five to forty per cent of the nitrites which were in the flour, from which it was made, figured on the basis of the flour, or, they retain about, well, that is the only figure that I have handy.

Q. Well, if made in the ordinary method, for domestic con-

sumption, if there is such a method?

A. Well, pound per pound,—taking a pound of bread and a pound of flour, of course, a pound of flour doesn't go into a pound of bread. There is only about one-third of it—.7 that is flour. You will get, in the bread, approximately twenty—around twenty per cent, of that which was in the flour, pound per pound.

Q. Now, may bread be so made from bleached flour as to leave it in a condition where nitrite reacting material is not recoverable—may the dough be so manipulated, or worked, or

treated, as to eliminate the nitrite reacting material

384 that is in the flour?

A. It may be. Bake it in, or bake it out, as I have said.

Q. How?

A. Why, if you give the flour a long fermentation and several kneadings, raising the loaf to a large size, and prick the loaf with pins, as is frequently done, and use a large amount of yeast, in the fermentation, you could bake it practically out. If you don't knead it but once, raise it but once, and keep the volume small, you will have a relatively large amount left in, and particularly if you use a small or an ordinary amount of yeast, you will have a large amount in it. The Koellner method uses a relatively generous amount of yeast, to domestic baking.

Q. How about the ordinary method, or the domestic

method?

A. I never have run any of the ordinary. It will be somewhere between the two, I would judge.

Mr. Butler: I think you may cross-examine.

## Cross-Examination

By Mr. Smith:

Q. You are not a doctor of medicine?

A. No, sir. Teacher of chemistry and an analytical chemist.

Q. For years you have been making an examination of

food products? A. I have. Made thousands.

Q. Has your investigation been limited to any particular kind of food products?

A. No. I have had rather a very broad range.

Q. That has covered fruits, and vegetables, and meats, and so on?

A. Well, only canned fruits. We don't hardly examine apples chemically, for adulteration. They don't adulterate them.

Q. I understand. But has it extended to meats?

- A. Meats? No, except for certain preservatives that have been added in certain canned goods, at certain periods.
- Q. You have examined flours, of course, for the purpose of ascertaining whether or not they contained nitrites?

  385 A. I have.

Q. Now, did you ever analyze any meats, for that pur-

pose?

A. No. Oh, I-no, I never examined meats.

Q. Did you ever make an examination of, say smoked ham?

A. No. sir.

Q. Smoked out on the farm, or smoked in the packing houses,—smoked with a hickory wood fire under it,—to ascertain whether it had nitrite in it?

A. No, but I know smoke has it in it.

Q. Well, do you know, as a chemist, that if hams are smoked in the smoke house, with a hickory fire under it, that those hams would have nitrites contained in them?

A. I never examined, but I know they would have them in the outer coats, and I think it has to do with the preserva-

tion of the hams.

Q. Yes, that may be all true.

A. I believe they have.

Q. You believe they have? You don't know that?

A. No, I don't know. I never analyzed them.

Q. Did you ever make an examination of bacon, as you find them on the markets?

A. I have not examined meats, as I tell you, on this subject.

Q. How does it come that in your examining of food products you have examined these meat products?

A. For nitrites?

Q. Yes.

A. Because I have never known that nitrites were added to them.

Q. Well, but you never have examined to find out whether they were or not?

A. No, but if there had been a rumor of any such thing, I would examine everything in reach.

Q. You never heard the rumor that nitrites were contain-

ed in smoked ham? A. No, as an added product, no.

Q. Did you ever hear the rumor that nitrites were contained in bacon? A. No, sir.

Q. That is new to you, is it? A. Yes, sir.

Q. Do you want this jury to understand, that, as a chemist-

[Q.] (Interrupting) Oh, your question, again? Did I ever hear the rumor that nitrites were contained in those? Is that it?

386 Q. Yes.

A. Yes, I have heard that rumor, and thought it would be, undoubtedly, in the outer coat.

Q. And you never made an examination to find the

amount? A. No, sir.

Q. Never did? So, you are not prepared to say whether the amount of nitrites contained in smoked ham, smoked with a wood fire, under it, and smoked out in the old smoke house,—whether that would contain more or less nitrites than this flour, here? A. I am not prepared to say.

Q. You are not prepared to tell this jury whether or not the bacon you buy on the market, here at Kansas City,—that is, the standard quality of bacon, or the highest grade of bacon that can be obtained—whether or not that contains more or less nitrites than this flour, are you? A. No, sir.

Q. You don't know anything about that? A. No.

Q. Have you ever examined vegetables as they grew, to ascertain whether or not they contained nitrites?

A. No. I have not.

Q. Have you ever examined beets, as they grow, and as they are found on the market, and as they come from the market, and onto your table, to ascertain the per cent of nitrites in them? A. I never have.

Q. You can't tell this jury whether or not there is any?

A. No, sir, I can't.

Q. Have you ever examined celery? A. No, sir

Q. Lettuce? A. No, sir.

Q. None of those products? A. None of them.

Q. How does it come that in your examination of food products— I will withdraw that. What has been the purpose of your examination of food products?

A. To find out if they were adulterated, substituted, or imitated, or whether they contained any added poisonous or deleterious material, or any substitution. That is practically it—it is adulteration in various forms, to see whether it is adulterated.

387 Q. You regard nitrites as a deleterious ingredient, don't you? A. Always.

Q. Now, why have you not examined any of these meats, to see whether or not they contained this deleterious ingredient?

A. Because I never knew any one was putting them into them.

Q. Well, why didn't you try to find out if they were put in the meat? A. Because I don't believe they are.

Q. Will you make an examination, and come and tell this jury whether or not smoked ham contains nitrites?

A. I believe it does. The smoke contains it, on the outside.

Q. Have you ever made an examination to find out whether the fish that you buy on the market contain nitrites?

A. Well, I have just made a rough test. There was a rumor that the fish that comes to us in barrels contain it in large amounts.

Q. Did you find it?

A. I merely took three samples, from the imported products, and in one,—mackeral—I found it. I could detect the nitrite reacting material, but much less than in bleached flour.

Q. Did you ever examine corn starch? A. No, sir.

Q. Well, as a matter of fact, about the only thing you ever did examine was flour, to see whether it contained nitrites?

A. No, I have examined those other substances, but they were drinking water.

Q. Well, we are not after the drinks, now.

A. I am telling you the things we commonly examine for nitrites, chemically.

Q. But you never examined any other food products than

flour, did you? A. No.

Q. Did you ever examine the air that you breath, to see whether there is nitrites in that?

A. No, but I have learned it, incidentally.

Q. That there are?

A. Under certain circumstances, and not, under certain circumstances.

Q. Take it yesterday morning, after the sun came out, after the rain of Saturday,—would you have found nitrites in the

388 A. After the rain of Saturday? The rain would have washed them practically out, and carried them away.

Q. And if you had examined the air, Sunday morning, you wouldn't have found nitrite in the air?

A. Not in an increased amount.

Q. I didn't ask you in an increased amount. Wouldn't it have been there?

A. Oh, if you are talking about infinitesimal amounts yes.

Q. Well, you are inhaling that into the lungs all the time?

A. Yes.

Q. Every second of the twenty-four hours? A. Yes.

Q. Now, did you say you had or had not examined corn starch? A. Never did.

Q. So you are not prepared to say whether it has nitrite,

or not?

- A. No. But I am, from other sources. I have ideas on that.
  - Q. Now, you got a sack of this flour, on April 13?

A. April 13; yes, sir.

Q. I believe that is the date. And how soon after that

did you make your examination?

- A. I begun it that day. We made the nitrite test practically that day, and then I made a new standard, and I confirmed it. I made a nitrite test a few days later, that confirmed the first one.
  - Q. Now did you analyze this flour for any other purpose?

A. Yes, I-

- Q. Did you examine it to ascertain the amount of starch that was in it?
  - A. No, I ascertained the color, in the gasoline solution.

Q. I am not asking you for that?

A. You asked me if I analyzed it for other purposes.

Q. No, what I am asking now is, did you make any examination to determine the amount of starch in it? A. No.

Q. Did you make any examination to determine the amount of gluten? A. No.

Q. Tell this jury, in a general way, what are the elements that— A. (Interrupting) Enter into the flour?

389 Q. Yes, that enter into the flour.

A. Well, the nitrogenous—the proteid element which enters into flour is the gluten, largely. It is the proteids of the flour. That amounts to, generally, from 10 to 12, even higher per cents. The ash of the flour varies in the quality of the flour, from, oh 30 odd hundredths up to 1 per cent in the clear, or even a little higher. The fat in the flour varies. It is a little lower in the higher grade flours,—in the patent flours, and it is—the shorter the patent, from the same wheat, the lower the fat, but when they use different grades of wheat, you can't tell anything about the grade of flour from the fat. Some millers put more fat in than others. The fat lies largely in the germ.

Q. Well, I am not asking you about the millers. I want to

know all the elements that constitute the flour.

A. I am getting around to that. One miller has more of one element than another.

Q. Well, I'll ask you another question and maybe we'll get through. Did you examine this flour for the purpose of ascertaining the amount of gluten that was in it? A. No, sir.

Q. Did you examine this flour for the purpose of ascertain-

ing the amount of starch in it? A. No, sir.

Q. Did you examine it for the purpose of ascertaining the amount of water in it? A. No. sir.

- Q. Did you examine it for the purpose of ascertaining anything, except the amount of nitrites which you found in it?
  - A. And the ash?
  - Q. And the ash.
- A. Let's see. And the color of the fat extracted from it, compared with an unbleached flour.
  - Q. All right anything else?
    A. Not that a recall, no. sir.
- Q. That's all? Now, did you find any nitrogen peroxide in this flour? A. Nitrogen peroxide?

Q. Yes, sir. A. Yes, sir. Free or combined.

- Q. Nitrogen peroxide is— A. (Interrupting) NO2.
- Q. (Continuing) A distinct substance in the chemical world as copper, or lead, or iron, is, in the mineral world isn't it?

390 A. What did you say?

Q. Read it? A. A distinct substance?

Q. Yes? A. Yes.

- Q. That is a distinct substance?
- A. I found it either free or combined.
- Q. You found nitrogen peroxide in this?

A. I think it is there.

Q. Did you find it there?

A. I found a thing which I believe represents that it is in there. I got its action, in there.

Q. I am not asking you if you got its action.

A. Well, I didn't get it out. I didn't get the gas out, itself.

Q. But the nitrogen peroxide is a gas? A. Yes, sir.

Q. You didn't find any gas in it? A. No, sir.

Q. Did you find any nitrous acid?

A. I found nitrogen of the nitrous acid.

Q. You did?

A. Yes, I found nitrous acid, but I didn't get it out.

Q. Why didn't you get it out?

A. Because the way you test for nitrous acid—Q. (Interrupting) No, I am not asking you that.

A. You asked why I didn't get it out. I am going to tell

you.

Mr. Butler: Why didn't you get it out?

The Court: I think he should be allowed to go ahead.

Mr. Smith: Yes. I beg pardon for the interruption.

The Witness: The only way we can determine the amount of nitrous acid, is the amount of chemical work it will do. Now, I found, in there, that there was chemically active nitrous acid, free or combined, or in the form of this gas.

Q. Now, you never took any flour from the Lexington mills, that was unbleached and bleached, so you could make any comparative tests of the bleached and unbleached flours, did

you? A. No, I think not.

2. You have made a number of tests from flours, though?

A. Yes, I have.

391 Q. Where were they bleached?

A. They were bleached in various mills, by various processes, three or four flours, and bleached in my chemical

laboratory.

- Q. Now, have you gone to any mill, and there obtained bleached flour, and, at the same time, unbleached flour, from the same grade of wheat, and milled at the same time, in order to make a comparative test? A. Yes.
  - Q. Where did you get them?
    A. Oh,—did I go to the mill?

Q. Yes.

A. No. I didn't grasp your question. I haven't.

Q. You have not? A. No.

Q. You have simply taken unbleached flour, and you have

bleached it in your laboratory?

A. I have also done that, but I have had many samples of bleached and unbleached flour, of the same flour, sent me by the inspectors of the department of agriculture, which I have examined.

Q. Yes, but you have never personally gone to the mill and

obtained it? A. No, sir.

Q. But you have bleached a great many samples in your laboratory?

A. I have bleached a great many samples, at different de-

grees.

Q. Now, in bleaching, in your laboratory, do you bleach with electricity, or do you bleach with chemicals?

A. Ordinarily I use bleaching chemicals, but I rigged up, also, a little mechanical device.

Q. But most of your experience in bleaching has been by means of bleaching chemicals?

A. Yes, sir; bleaching chemicals, by putting this gas in.

Q. Now, I believe you say that in this bleached flour, the mineral acidity is changed. What do you mean by that?

A. I mean that the mineral acidity is added in the bleaching.

Q. You think it adds a mineral acid, do you?

- A. I know it adds a mineral acid, but whether I can ascertain the amounts, and show it, by analysis, I don't claim that.
  - Q. You don't claim you can demonstrate it, by analysis?

A. Not mineral acids, no, sir.

Q. How's that?

A. I don't, really. That is my opinion, based upon the

392 fact that we put into it nitric and nitrous acids.

- Q. But you have never been able to demonstrate that unbleached flour, as compared with bleached of the same wheat, and milled at the same time,—you have never been able to demonstrate that there was greater acidity in one than the other?
- A. Not in the milled flours, but in the laboratory flours, where I have exaggerated the conditions.
- Q. Now, as to the odor and flavor,—and do you mean the same thing, when you speak of odor and flavor?
- A. No. When I say "flavor" I mean taste, and when I say "odor", I mean smell.
  - Q. And do you say bleaching changes the odor of the flour?

A. It very frequently does.

- Q. Well, do you mean to say that is a universal rule, or that it sometimes happens, and it sometimes don't?
- A. It is in degree. Very frequently you can't notice any change.
  - Q. Very frequently you can't notice any change? A. No.
- Q. If I would hand you some flour, here, could you tell the jury whether it had been bleached or unbleached by the flavor of it?
- A. I could, if it was strongly commercially bleached, I could, provided it was sound, of course. I think I could.
- Q. You think you could tell the jury that, by the odor, whether or not it was bleached?
- A. I think I possibly could. I don't know that I could. I think I could. I say, if it was strongly bleached, commercially.
  - Q. Well, how strong has it got to be bleached?

    A. It has got to be strong. As strong as this.
- Q. Well, all right. If it is bleached as strong as this, do you think you can?
- A. I don't know that I can, from the flour. I can from the bread. I just get these odors from the bread.

Counsel for defendant produces sample of flour, which he requests be marked as exhibit, which is accordingly done, being marked "Exhibit 208".

Q. Can you tell the jury about this (handing exhibit to

witness)?

A. If I had that flour bleached and unbleached, then I could distinguish, in the odor, but without the comparison, I don't know that I could say.

393 Q. Will you try it?

A. If you will give me the other, I will be glad to.

Q. Smell that, if you will, and tell the jury whether you can say whether it is bleached or unbleached?

A. I don't care to make the experiment, unless you will

give me the other.

Q. All right. You don't care to make the experiment on this?

A. I will, if you will give me the other of the pair.

- Q. You are not willing to test this flour that is marked as exhibit 208, and tell the jury whether or not it is bleached or unbleached?
  - A. No, sir, not without a comparison with the other sample.
- Q. Now, the color, of course, of the bleached flour, is noticeable, from the unbleached? It is whiter?

A. It is lighter.

Q. Yes, it is lighter?

A. And it has a different shade.

Q. Now, flour which ages naturally, becomes whiter with age, don't it? A. Yes, sir.

Q. Tell the jury what it is, the nature's laboratory, that

Oxygen? A. Oxygen. Q. Oxygen? A. Sunlight.

Q. That is a constituent element of the air, isn't it?

A. Yes.

Q. Then flour which is exposed to the air becomes bleached by nature, does it?

A. To an extent; yes. Q. Well, to an extent.

Q. Well, to an extent.
 A. Not to this extent. Within reasonable limits of aging.

Q. But would it, if it were exposed longer?

A. I think it would.

Q. Sir?

A. I think it would. I think it would get chalky white if you would leave it long enough, exposed to the sunlight, and heat and oxygen, spread it out thin.

Q. Then, if unbleached flour were subjected to the atmosphere a sufficient length of time, it would become bleached as much as this other, you say?

A. It would, and it would be just as flavorless.

Q. Now, would there be nitrites imparted to them?

394 A. If it was exposed in a thin layer and bleached in that way, I should think there would be possibly. It is according to the air,—whether the air was pure or not. If you were to put it out there it would,—if you were to put it out there in the smoke.

Q. In other words, if a flour is stored in a ware-house in

Kansas City, nature would bleach it? A. Yes.

Q. And nature would impart nitrites to it?

A. No, it wouldn't.

Q. Didn't you say the air contained nitrites?

A. No, I didn't say any kind. I say, if it was spread out, then, outside that window, then it would.

Q. All right. If flour, in Kansas City, was spread out on

a surface where the air reached it-

A. (Interrupting) And the smoke reached it and circulated through it.

Q. Yes,—the conditions as they exist in the atmosphere.

A. In the city; yes, sir.

Q. You say they would be bleached? A. Yes, sir.

Q. And nitrites would be imparted to it?

A. Yes, sir.

Q. Now, isn't it true that, if it were spread out in the open, in the country, and exposed to the atmosphere, that that would whiten it? A. Yes, sir.

Q. And isn't it true that that would impart nitrites to it?

A. No, sir. In my opinion it would not.

Q. Did you ever try it?

A. No, sir. Never tried it.

Q. Now, if it were true that flour exposed on the top of a building, away from the city—away from this smoke that you get from your high smoke-stacks,—that, in the course of two or three or four days, it would show the reaction for nitrites, the same as bleached flour does, it would be because nitrites had been imparted to it by that process, wouldn't it?

A. Yes, I think so, or developed in it, of course.

Q. Now the nitrites which would be imparted to that flour would be the same nitrites which you found in this flour, wouldn't it?

A. I don't know as to that.

Q. You don't know? You said that this exposure to the air would develop the nitrites? I believe that was the expression you used?

A. No, I didn't say the exposure, to the air, would de-

velop it. What did I say?

Q. What did you say developed the nitrites?

A. I don't know that I used the expression.

Mr. Scarritt: Read it.

The Witness: It might be, in some unusual conditions, something like that; that's all.

By Mr. Smith:

Q. You say rain would carry nitrites into it?

- A. The rain washes the nitrites out of the air, and takes it into the soil. That is one of the purifying processes of nature.
  - Q. Then there are nitrites in the air?

A. Why, there are nitrites in the air, certainly.

Q. And as we breathe it, we breathe them into our system?

A. We certainly do.

Q. And as the air circulates through the bags of flour, it is carrying nitrites with it, isn't it?

A. It wouldn't circulate in there.

Q. But you say there are nitrites in the air?

A. There are.

Q. And wherever the air circulates, it carries nitrites with it?

A. Yes. But it don't circulate through a bag of flour.

Q. But wherever the air does circulate, wherever it does strike the flour, or any product, it carries nitrites with it, does it? A. Yes, but they don't always stick.

Q. Yes? All right. Now if you would confine your answer

to my question we would get along faster.

A. Well, I want to give my opinion squarely.

- Q. When the air circulates through your lungs, it carries nitrites with it? A. Yes.
  - Q. And when air circulates over the surface of flour, it carries nitrites with it? A. Yes, sir.
- 396 Q. And that nitrite which it carries is the same nitrite as that which was imparted to this flour by this bleaching process, wasn't it? A. I think so.

Q. Now, I think I asked you this question, but I am not sure,—did you ever get any flour from this mill, and make

a test of the strength of the gluten?

A. No. I never did.

Q. Did you ever make any test of the strength of the gluten from other flours that you obtained from different mills?

A. I have, some of them.

Q. Now, how did you make that test?

- A. Well, we make the test, practically,—Mr. Baily did some of that work.
- Q. Well, I don't care anything about what Mr. Bailey did. I want what you did. We will let Mr. Bailey testify what he did.
- A. I doughed up those flours,—and pulled a dough, made them into bread, and they would break down. If they were

not blenched heavily, the bread didn't hold the gases, and I washed the gluten out, and put it in Foster's gluten tester, and compared it. I got comparatively less results.

Q. Well, now, were those flours that had been bleached at

mills, or bleached in your laboratory?

A. Bleached in mills—commercial mills.

Q. I see. Now, how many different experiments have you performed in the baking of bread, to ascertain whether or not

there were still nitrites in the bread, after baking?

A. Only four pairs. By another method, where I wasn't testing for that purpose, at all, but where I analyzed the bread, I have made quite a number. I have made perhaps,—let's see.

I don't know the exact number, maybe 30.

Q. What would you say, now, as a chemist, if bread which was made from unbleached flour, flour which, at the time was free from any nitrites, was baked in an oven in which the fuel used was coal, or in a gas oven, where the products of combustion might reach the bread what would you say, as to whether there would or would not be nitrites in it?

A. I think there might be a trace of nitrites.

397 Q. Yes? There would be nitrites in it?
A. I said there might be a trace of it.

Q. Now, when you take bleached flour, and you make bread out of it as the ordinary housewife does,—she uses yeast; she

sets it at night- A. Sponge.

Q. And she lets it raise during the night, and then, during the morning, she works it down, and then bakes it,—what would you say as to whether that bread, made from bleached flour, would or would not contain nitrites?

A. I think it would .- What was the question-made from

bleached flour?

Q. Yes,-bleached flour.

A. Yes, I think so. Yes, it would. Q. Did you ever test that? A. No.

Q. How do you know it?

A. I believe it would, because I use a similar method, and I found the conditions under which these nitrites pass out of bread.

Q. But you never baked any bread as the ordinary housewife bakes it, namely, setting her yeast sponge at night, with Fleischman's yeast, or something of that sort, and let the sponge raise over night? A. Yes.

Q. And then work it down, and then bake it. Now, you never tested any bread of that sort, to see whether it con-

tained nitrites or not, did you? A. Never did.

Q. So, anything you might say, would simply be an abstract opinion?

A. No. It is an opinion based upon some other work.

Q. Yes? But you are of the opinion that bread made from unbleached flour, if baked in an oven where they used coal as fuel, or where they used gas as fuel, and where the products of combustion circulated around in it, that, in that bread, there would be nitrites in it? A. A trace. A small amount.

Yes,-a small amount? A. Yes, sir.

And that would be the same character of nitrites as that which you found in this flour, wouldn't it?

So far as the nitrites are concerned; yes.

Yes? Now, what do you say, as a chemist, as to Q. whether or not flour, unbleached, brought into the kitchen absolutely free from nitrites, and put into the 398 pantry off the kitchen, in a flour bin, in a home where they use gas for lights, or where they use gas in the kitchen range, or where they use coal in the kitchen range,-what would you say as to whether that flour in the flour bin will show particles of nitrite in it? A. I think it will not,

Are you quite sure of that? A. Yes, sir.

Did you ever make any test of it? Q. Never did, but I think it will not.

So, your opinion is not based on any practical demon-Q. stration? A. If it was in the flour bin it would not.

Well, let us assume it was not in a hermetically sealed

bin? A. I supposed it was in an air-tight bin.

Let us assume it was in the bin where the air circulates through it?

If the air was bad, but I don't know how bad. A.

It is true that the burning of gas lights in the kitchen O. will impart nitrites to the air, isn't it? A. Yes.

And it is true, too, burning coal in the kitchen range? Q.

A.

And the air, if allowed to circulate through there, from the kitchen, due to the burning of gas, will leave nitrites in it?

A. Yes.

O. And they are the same nitrites you found in this flour?

A. So far as the nitrites are concerned.

And one is just as bad as the other, isn't it? Q.

A. Yes, sir.

And that nitrite which is in the kitchen air, due to the burning of gas, will be imparted to the flour that is exposed to the air, wouldn't it? A. Yes, to some extent.

Q. And that is the same nitrite that you found in this, isn't it? A. Yes.

Q. And one is just as bad as the other, isn't it?

A. Yes, sir.

Q. No worse? A. No, because it is just as bad.

Q. And so, if you had unbleached flour, free from nitrites when it is brought into the house, and the kitchen is lighted up by gas lights, and they bring that flour out on the table, and they use it there in making pastries, or making bread, and expose it to the atmosphere in which the gas lights have been burning, there would be nitrites imparted to that by that, and by cooking in the kitchen?

A. Maybe by cooking it. I don't think there would be by

taking it out and working it, and mixing it up, at all.

Q. Well, all right. But, in preparing it, there, and exposing it, and getting it ready for consumption in the family, nitrites would be imparted, wouldn't it?

A. A trace might.

Q. And that is the same nitrites you found here?

A. Yes, sir.

Q. So, we seem to be in for it, most any way, don't we?

A. Yes.

400

Q. Now, you spoke of patent flours. You say it contains the better portion of the content of the wheat?

A. Yes. Did I say the better portion? Yes, I did.

Q. Well, now, don't you believe that flour which contains all of the berry of the wheat is the better flour?

A. Better, how?

Q. From the standpoint of nutrition?
A. It is more wholesome, and I prefer it.

Q. All right. We are simply getting your opinion, or your judgment. A. Yes.

Q. In your judgment, the flour which contains 100 percent of the berry of the wheat is the most nutritious flour?

A. No, not the most nutritious. I said the most wholesome.

Q. But the flour which contains 100 per cent of the berry of the wheat, is the most wholesome?

A. Yes, but not the more valuable.

Q. But you are talking about what it will sell for on the market? A. Yes.

Q. But we are not quarreling, here, over the value of it on the market, but as a wholesome food product, and, in your opinion, the more nearly it contains the whole content of the wheat, the better flour it is?

A. Yes, sir, I use the graham bread in my family.

Q. Then, in your opinion, the miller who puts in 95 per cent of the whole wheat makes a more wholesome flour than the one who puts in 30 per cent? A. No.

Q. Didn't you say the more the better?

A. No, not in this case. I think the bran perhaps does make it better, but there is a difference between the bran in the

outer part, and the part near the bran. There is a distinction, there.

Q. No, but you made it clear that, in your judgment, flour which contained the whole product of the wheat was more wholesome? A. I believe it is.

Q. You never saw any schedule prepared by your department, and issued under authority of your department, fixing a standard for patent flour? A. No.

Q. Neither as to per cent of patent, or per cent of ash, or per cent of gluten, or per cent of anything else, did you?

A. No, sir. I should oppose such a standard.

Q. As a matter of fact, no two millers have the same, have

they? A. No, sir. Not wholly.

Q. In making these experiments in your laboratory, how long did you subject your flour to this nitrogen peroxide which you had prepared?

A. Oh, long enough to shake it up so that all of it dis-

appeared in the bottle, like that (indicating).

Q. Well, that don't give me much information. Was it five minutes, or two minutes, or an hour?

A. It wasn't a minute. Just till the gas was absorbed. Shook it thoroughly, so you could see no more gas, or smell no more gas, in the bottle. Then you can dump it out.

Q. You did that until you could smell no more gas, when

you took it out of the bottle? A. Yes.

Q. Now, you had the flour in a closed receptacle?

A. Yes, sir; in a two-gallon bottle, generally.
Q. About how much flour did you put in there?

A. I generally put—better give it in pounds?

O. Yes, We know what it means, then.

401 A. I took about a pound and one-tenth. I took 500 grams.

Q. How much nitrogen peroxide did you subject that to?

A. Varying amounts. I will give that now, in liquid ounces, then you can understand it. From about 1-6th of an ounce, 1-3 of an ounce, 2-3rd of an ounce, an ounce, and increased amounts over that to a pound and 1-10th of the flour. I use cubic centimeters, of course,—5, 10, 30, 40, 50,—and that way,—cubic centimeters.

Q. Yes? A. And 30 cubic centimeters is an ounce.

Q. And you put it in this glass receptacle and shake it up?

A. I shake it up until the flour absorbs the gas.

Q. Then, when you take it out of there, what is the condition? A. The gas was absorbed, and it was flour.

Q. The gas was all absorbed?

A. I mean it was all taken up with the flour.

Q. You don't mean it escapes, then?

A. It would escape, gradually, possibly, some of it, but it was all absorbed, and the flour was bleached, and the two conditions, are, then—Well, those are the conditions,—that when you shake this flour up with the gas, the gas is gone, and the flour is bleached.

Q. Now, do you know the strength of the solution to which you subjected the flour? A. The dilution?

Q. Yes.

A. In the bottle? Oh, I can figure it, very roughly.

Q. Well, how much nitrogen peroxide to a cubic foot of air?

A. Well, the dilution is varying amounts—from 1 to 1000, in the bottle, and starting from that, and getting more concentrated as the series runs up, and if I took the same amount of flour, and the same two-gallon bottle, there would be 3,500 and something cubic centimeters. In a gallon there would be 7.000, and in the two-gallon bottle, not counting the dump where the stopper is; and I would put into that 7000 volumes, and 5 volumes, and 10 volumes, and 30 volumes, and that is past the range that we are discussing here.

The Court: We will take a few minutes' recess.

402 (Recess taken for five minutes.)

Dr. Andrew S. Mitchell, resuming the stand, testified further as follows:

Mr. Butler: Is that all, Mr. Smith?

Mr. Smith: Yes, sir.

# Redirect Examination

By Mr. Butler:

Q. Is there any difference in the effect of treatment of flour by nitrogen peroxide gas, mixed with air, depending upon the way that the gas is made—that is, whether it is made by chemicals, in a laboratory, or whether it is generated by the Alsop flaming are process?

Mr. Scarritt: We object to that, because that is a question for the jury to decide, after both have been described.

The Court: Objection overruled.

A. There is not.

By Mr. Butler:

Q. On the lapse of time after bleaching, does the amount of recoverable nitrite reacting material in the flour increase, or diminish? A. Diminishes.

Q. Can you give us any information affecting the degree or

rapidity with which it lessens, as time goes on?

A. Yes. This is just vaguely. It varies with the different flours, and the different conditions of storage. Warm weather increases the speed with which it diminishes, and apparently flours,—low grade flours,—it disappears more rapidly than in the others, but it disappears so that, after 20 days, you will get about the same amount recoverable, where 30 c. c.'s have

been used, as you would where 20 had been used, if you 403 tested it three days after. If you tested it three days after bleaching. Flour bleached with 20 c. c. gas per

kilo.

- Q. Then the quantity of gas, as I follow you, would be about one-third less, in a month after bleaching?
  - A. Yes. Depending very considerably upon conditions.
  - Q. Yes, I understand,—the heat and temperature?

A. The quality of the flour, and its exposure.

Q. And the manner in which it is packed, and all those

things. A. Yes, sir.

Q. Now, as respects nitrite reacting material, or nitrites, as designated in your cross-examination by Mr. Smith, in the air, the quantity, compared with the quantity found in this flour. What do you say?

A. Why, with the lapse of time-if I get your question-

with the lapse of time—Read the question.

Q. No, strike out the question. It is apparent you don't get it. You have just told me that the amount of nitrite reacting material in bleached flour lessens, upon exposure?

A. Yes, sir.

Q. In your cross-examination, you told Mr. Smith that there were nitrites, or nitrite reacting material, in the air?

A. Yes, sir.

Q. Now, as to the quantity in the air, compared with the quantity in the flour. That is what I am trying to get at. Which is greater, and how much?

A. Why, this is very infinitesimal, in the air.

Q. Will bleached flour take on more nitrites from the air, or impart nitrites to the air?

A. It will impart it to the air.

- Q. What in your opinion, is the truth with respect to this bleached flour, here in the court room, as to whether or not it is taking on nitrite from the air, or liberating this gas into the air?
  - A. It is liberating the gas into the air, to a slight extent.
- Q. And as respects the quantities of nitrite reacting material which you say that you understand to be in other articles

of food, like smoked ham, as compared with the flour seized in this case. Are you able to give us any expression 404 about that?

A. My examination isn't sufficient to give you any idea of quantity, and I can only say that the nitrites which are

present are undesirable.

Q. Now, can you tell us, under the assumption of facts proven in this case, namely, that this flour was made and bleached in Lexington, Nebraska, on the night of the 31st of March, last, and your analysis, after shipment to Castle and from Castle to St. Paul, was about two weeks later,—the 13th of April— A. When was the flour made,—pardon me?

Q. The 31st of March. Your analysis was the 13th of April.

as I got your testimony.

Mr. Scarritt: He received it.

The Witness: I received it.

## By Mr. Butler:

Q. Did you analyze it when you received it? A. Yes; for nitrites. I made that test, at once.

Q. For nitrites? A. Yes, sir.Q. Quantitative? A. Yes, sir.

Q. Now, can you express to the Court and Jury the volume of nitrogen peroxide gas added to that sack of flour which you received? A. I can.

Q. I mean, the undiluted nitrogen peroxide gas?

A. I estimated that there was 20 cubic centimeters of the gas used, providing this flour was freshly bleached. On the other estimate, it would be about—if it was diminished one-third, there would be about 30 cubic centimeters of gas added, per kilo of flour, or, figured on the weight of the sack of flour, it would be, oh, a pint and a fifth, on the cubic centimeter test.

Q. That is, there would be a pint and one-fifth, of undiluted nitrogen peroxide gas, added to the sackful of flour shipped to you? Is that what we are to understand?

A. In volume. One pint and one-third. There would be 21

and a fraction cubic ounces.

Q. Now, so as to give us something that we have seen;
405 How much in volume of that gas would it be, if diluted to the degree of dilution as was the gas made and brought here at the time that Doctor Shepard testified, in the bottle marked Exhibit 6. That was diluted 1 to 4, I think.

A. Yes. 1 in 5.

Q. And that would be how much gas, of that dilution?

A. It would be 5 times that volume.

Q. It would be four times the volume? It is 4 to 1.

A. If it has the volume of 4 added to 1, that is 1 in 5.

Q. Very good.

A. It would be 5 times the volume, wouldn't it?

Q. Yes, I believe so.

- A. That would be approximately 7 pints—nearly a gallon, in volume.
  - Q. Nearly a gallon in volume, of the dilution shown?

A. Yes, sir.

Q. By Doctor Shepard's exhibit 6? A. Yes, sir.

Q. Into the sack of flour which you analyzed?

A. Yes, sir.

Q. In your cross-examination you spoke of nitrites being imparted to the flour, in the contaminated air of cities. Now, as to the degree of that. If the flour-be spread out thin, you said, something. Now, if it be stored in sacks and barrels, etc., which way would it receive the most?

A. It would receive the most, if spread out thin, the same

as if you would spread butter out thin, in the sun.

Q. Now, this Griess-Illsvoy test is a delicate test, we have

been told. A. Yes, sir.

- Q. How small a quantity of nitrite reacting material is it understood by chemists, generally, that this Griess-Illsvoy test will disclose, by the color reaction, as described by one of the other witnesses?
- A. In pure water, with nothing interfering, it will disclose—it is generally fixed, one one-thousandth of a million thousand.
- Q. That would be about one to one billion, in ordinary conditions? A. Yes, sir; in pure air.

Mr. Helm: What is that? One per billion?

Mr. Butler: Yes, or a thousand million.

406 Mr. Smith: That's beyond me.

Mr. Butler: Well, I will write it.

Mr. Smith: Oh, I can write it, but I can't comprehend it.

The Witness: I should like to add that it will disclose that delicately, but you can't estimate anywhere near that delicacy.

By Mr. Butler:

Q. That is the understanding of chemists, that the color would be affected? Now, to get nearer to things, in size: Assuming that your opinion is right, that there would be 7 to 8 pints of gas, of the dilution shown to us by Prof. Shepard, added to the sack of flour which you analyzed, and assume, further, that that combined in the ordinary methods, in the flour, with bases of the chemical value of sodium, how much such

nitrites or nitrite would be formed in a sack of flour, expressing it in some terms of weight that is familiar to Jaymen?

A. May I compute, roughly?

Q. Yes.

A. There would be about four grains in the sack of flour, based on the amount of my recovery.

Mr. Scarritt: Four grains, did you say?

The Witness: Four grains, sodium nitrite, in the sack of flour, based upon the amount of my recovery. We estimate those substances in grains—in pounds.

By Mr. Butler:

Q. Now, your statement was, as I recall it, that about onehird to one-half of that would remain in bread made by the Kaellner process?

A. No. My statement, estimated on the dry basis, my estimate was that the bread, itself, would contain possibly one-fourth of them, or 20 per cent of them.

O. About one-fourth?

A. Yes, or one-fifth of it. I will put it conservatively.

Q. How many loaves of bread, about, will 48 pounds of flour make? A. About 70 or 75. 70.

407 Mr. Butler: I believe that is all.

# Recross Examination

By Mr. Smith:

Q. Can you detect the presence of these nitrites in the

flour, in as minute quantities as in the water?

A. I didn't answer the last question of Mr. Butler's. I was just computing. I said there was 70 loaves of bread, made from that sack.

Mr. Helm: That is the question Mr. Butler asked you.

The Witness: I understood another question followed.

Mr. Butler: Well, my attention was drawn to something else. Just read my last question, and the answer.

(Question and answer read by the reporter.)

By Mr. Smith:

Q. Can you detect the presence of nitrite in the flour, in as minute quantities, as you said you could in water?

A. No, sir

Q. What would be your judgment, as to how minute quantities you could discover in flour. I believe in water you said one part to a billion? A. Yes.

Q. In flour, you would have how much-one part to how

much?

A. Oh, if there are small amounts present in the flour, you can take larger amounts of the flour and detect more delicate amounts. You could detect in the flour, if you had to—

Q. (Interrupting) One part in how much?

A. One part in-well, in one [hundredth] million.

Q. One part in one hundred million? A. Yes.

Q. In other words, if there was one pound of this nitrite in 100 millions pounds of flour, you could detect it?

A. Yes, sir.

Q. Now, let's see: Assuming that 20 thousand would make a carload—If there was one pound of it in 50 thousand carloads of flour, you could detect it, could you—assuming that there are 20 thousand pounds in a carload of flour.

A. 20,000 pounds would be 10 tons?

Mr. Butler: Mr. Smith, there is more than 10 tons in a car of flour.

Mr. Smith: No, I think 20 thousand pounds is a carload.

Mr. Butler: What is the tariff minimum on that?

Mr. Smith: I think the tariffs run from 20 to 24 thousand.

Mr. Butler: They make this on the wheat rate?

Mr. Smith: I know that the average carload of flour is about 20 thousand pounds.

Mr. Butler: That's not the way they make tariffs.

Mr. Smith: I never made a tariff.

Q. Assuming that 20 thousand is a carload, then, in that 100 million pounds, there would be 50 thousand carloads of flour, wouldn't there? Divide 100 million by 20,000.

A. Yes.

Q. Then, if you had one pound of this, in 50,000 carloads of flour, of 20,000 each, you could detect it, could you?

A. Yes. Could get a trace of it. You wouldn't call it bleached flour, though.

Mr. Smith: That's all.

Mr. Butler:

Q. That would be more like the atmosphere, wouldn't it, than bleached flour? A. Very much.

(Witness excused.)

409 Walter Kempster, called as a witness on behalf of the Government, being first duly sworn, testified, as follows:

## Direct Examination

By Mr. Butler:

Q. What is your name?

A. Walter Kempster.

- Q. Any middle name, Doctor? A. None.
- Q. K-e-m-p-s-t-e-r? A. That's right. Q. Doctor, how old are you? A. 69.

Q. Where do you reside? A. Milwaukee, Wis.

Q. And are you a regular practising physician, there?

A. Yes.

Q. And you have been engaged in that profession for how

long? A. Since 1864.

Q. Will you give us your education and experience, and qualifications, and specialties—special work, etc., if you have any, and, Doctor, I would like to have you disregard any considerations of modesty, and tell us all about your work, so the jury and the Court may understand who you are, and what your means of knowledge concerning matters we are to

examine you upon, are?

A. I am graduate of Long Island College, Brooklyn, N. Y., 1864. I first did professional work in the army, during the civil war. I aftewards became interested in the subject of nervous disorders, and have made that a specialty, from that time till the present. During that period, I have served as an assistant physician in a New York hospital for the insane, for 8 years. Afterwards as superintendent of the Northern Hospital, in Wisconsin, for 13 years. I have investigated conditions—economic conditions concerning the emigrants coming from the foreign countries into the United States, for the United States Government. I have investigated the subject of transmission of cholera and other dangerous, infectious diseases, from the several countries of the old world, into the United States.

Q. And have you given any attention, in your work, to the matter of foods and diet, and the effect of same upon health and well being of the people? A. I have.

Q. Have you heard the testimony which has been so far given in this case? A. Yes.

Q. Are you familiar with the substance known as nitrogen peroxide gas? A. Yes,

Q. Describe its character, to the jury, especially as regards effect of ingestion, with food, or otherwise, into human

beings?

A. The ingestion of this material by human beings has several effects. First, It impairs digestion; acts to check the digestion of not only bread, but other foods. By digestion, I mean that process which takes place not only in the stomach, but throughout the entire intestinal tract. There is not only

a form of disorder known as stomach indigestion, but also a form of disorder known as intestinal indigestion, which, in its way, is as serious as stomach indigestion. It induces constipation, on account of the indigestion. It passes from constipation into a condition that is known to the profession as obstipation, meaning very obstinate constipation. That still further interferes with the processes of digestion and the processes of the absorption of food; food, as you know, being absorbed through the walls of the stomach and the intestines into the blood. This peroxide of nitrogen, finding its way into the blood, comes in contact with minute bodies—cell-like bodies, which we call corpuscles, and the action of the remedy is to prevent these corpuscles from doing their duty. To put it in English, these corpuscles become rusty.

Q. Become what? A. Rusty-like rust.

Q. Yes.

A. Like rust on bright metal. I used that term merely to try and explain the matter. So that the corpuscle which is thus affected, can no longer carry oxygen, which it is designed to carry from the lung to the tissues of the body. Neither can it take from the tissue of the body the material which it

must take out, if the person is to remain in health. So that these blood cells, or blood corpuscles, become af-

that these blood cells, or blood corpuscles, become affected, and, in turn produce a form of disease which is known as anemia, or a bloodless condition. That disease, intensified is known as chlorosis, which is a very sever form of anemia. The destruction of the blood corpuscles will produce those forms or disease.

Q. Now, in my question, I used the expression "nitrogen peroxide gas." There has been used, here, "nitrous nitrogen", and "nitrite reacting material", by those who have examined the flour in question descriptive of the substance added by bleaching. Now, that there may be no confusion in terms,—in your answer, What did you intend to attribute the effects that you have described, to?

A. The peroxide of nitrogen.

Q. Peroxide of nitrogen? That is, the gas itself?

A. Yes, sir.

Q. Now, assuming the truth to be, that this bleaching proccess employed nitrogen peroxide gas, mixed with air, and brought the mixture into intimate contact with the flour, in a state of agitation, and that, as a result of such treatment, there was added to the flour nitrite reacting material, which has been described in the evidence here, and also that it would remain in food made from the flour, either in whole or in part. Can you tell us whether or not, in your opinion, an injurious or deleterious or poisonous substance is imparted by such process to the food so made? Mr. Scarritt: We object to that, because he has not qualified himself, if your Honor please, because it is asking for the conclusion of a witness, that is solely in the province of the jury to determine.

The Court: Objection overruled.

Mr. Scarritt: Exception.

The Witness: Assuming that the substance is added, as you have stated, it is a poisonous substance, and deleterious to health.

By Mr. Butler:

Q. Now, will you describe, assuming the quantity so added to be minute—small—what is your opinion as to the effect upon health?

A. It does not change my opinion, because that is not the only substance taken in bread which produces disease, taken

in very minute quantities.

Q. In your opinion, what effect upon health would the use, in bread, of such nitrite reacting material, added to flour by

this process, have, or tend to have?

A. It would have the effect to destroy a large number of the red blood corpuscles, and put them out of their functional purpose, not only so, but, being out of use, they are in the way, so to speak, and interfere with the functional service of the red corpuscles, that may remain in good order.

Q. And the function of the red corpuscles is what?

A. The function of the red corpuscles is to carry oxygen from the lungs to the tissues of the body, and to carry from the tissues of the body to the lungs the material, which must be removed from the body, if the person is to live.

Q. Then, as I take it, it is a conveyor of oxygen from the lung to the tissue, and of rejected matter, from the tissue to

the lung, where it is exhaled in the atmosphere?

A. That is correct.

Q. And is the performance of such function necessary to life?

A. It is. Life depends upon the performance of that function, and any interference with that function interferes with health.

Q. And if the obstruction be complete, it would result in death by smothering? A. Death follows.

Q. Death by smothering?

A. Yes, to use an English expression. They smother to death—strangle.

Q. Aside from the effect of such nitrites upon the function of the blood as a carrier of oxygen to tissue, has it any other effect, except upon digestion, which you have described, but upon blood, or action, or flow of the blood?

A. Yes.

Q. What is it?

A. It weakens the action of the heart, and the flow of the blood is not as it was intended by nature that it should be.

413 Q. What effect has that, upon well-being?

A. The tissues do not receive the quantity of oxygen

that is necessary to maintain them in a normal condition,

Q. Now, with respect to this nitrite reacting material. I would like to get you to compare the effect, if you can, upon people of different power,—the young, and the old, and the weak and the strong, and the well and the sick, etc.

A. A well man, meaning a man in normal condition, would resist the action of the agent much longer than one who was delicate, or who was suffering from some form of disorder. A stronger person would resist it a greater length of time, but,

in the end, he, too, would succumb.

Q. Now, the effect, or rule, or law, in your profession,—if there is one,—as to the effect of continued eating of such a substance, regularly, as bread, we will say, is consumed in the

human family. What is the effect, in that regard?

A. It is more harmful, than to take a larger dose at one time, or for a very short time, because the conditions produced by the ingestion of the material, acting continually on the blood, or on these cells in the blood, reduce them in number, and in their capacity for doing work, and when they are so reduced, they cannot perform the work required of them; and the man, himself, is no longer fitted to perform the duties which he would do if he had not taken the material. —if I may be allowed to use a comparison—that is illustrated very perfectly among those people who use, for a considerable length of time, rve bread. There is a form of disease which manifests itself in those who use rye bread, in which the rye has been "smooted", as it has been called. They, after a time, have a form of disease known as chronic ergotism, which almost always results in death. It is quite common in certain parts of Russia, and it is also found among people who live very largely upon meal made from a low grade of corn, as in certain parts of Italy, where the continued ingestion of the smoot-

ed corn induces a form of disease known as pellagra,

414 which is very fatal.

Q. Now, in such instances, is it because of the continued use of the smooted rye bread, and the corn?

A. It is because of the continued use of the rye bread, in the one place, and the smooted corn in the other place. Q. Are nitrites, or some of them, used as medicines, administered to sick people by physicians? A. Yes, sir.

Q. What form of nitrite, or nitrites?

A. A medicine that is referred to now as nitrite of amyl.

Q. What is a medicinal dose of nitrite?

A. It is used, ordinarily by inhaling, and the usual dose is 5 drops, as it is administered now. It was, at one time, administered much more freely, until the deleterious effect produced by its administration was discovered, and then it was very largely discontinued. They use it now infrequently compared with what they used to.

Q. Now, what therapeutic effect results from such admin-

istration, if given?

A. It was prepared, originally, to check or interrupt spasmodic forms of disease, as epilepsy.

Mr. Butler: I rather think that will be all, your Honor.

The Court: You need not formally close. Court is in recess until 2 o'clock.

## (Recess taken as ordered.)

#### Afternoon session.

Kansas City, Missouri, Monday, June 6, 1910.

Dr. Walter Kempster, in continuation of his direct examination, testified as follows:

By Mr. Butler:

Q. In your examination this morning, Dr. Kempster, made an explanation of the use of amyl for medicinal purposes. I want to ask you whether or not it hasn't an effect

comparable with nitrites such as are produced in flour by bleaching, by means of this nitrogen peroxide gas mixed

with air? A. Yes.

Q. Now, as to the extent of your observation of the use of that substance and the character of the effects produced by its regular use, I would like to have you speak.

A. It was used regularly in the hospital with which I was connected for the treatment of epilepsy.

Q. At the insane hospital you mentioned?

A. That was at the hospital in New York, however, the wards set apart for the treatment of epilepsy were not exclusively used for the insane; there were many epileptics there who were not insane, were there for treatment, and so that there were both sane and insane epileptics under observation. The remedy was introduced because it was believed to be almost a specific for the treatment of spasmodic difficulties, and it was used at that time quite freely to overcome those

difficulties, and the doses used were larger, much larger than are used now. After using the nitrite of amyl on about two hundred cases for a period of time it was noticed that the general health of the epileptics was becoming impaired; it was so noticeable that the continued use of the nitrite of amyl was stopped, and then investigations began in the hospital, and we became satisfied that it was the nitrite that was producing difficulty, and after that the agent was not used excepting in very rare instances, and has not been used in my practise from that time until the present excepting only as I have found it used when I have been consulted, and have invariably recommended its discontinuance on account of the impaired health that follows the continued use.

Q. Now, is nitrite of sodium used as a medicine?

A. It is.

Q. And a medicinal dose of nitrite of sodium?

A. It varies. The dose that I have used personally has been one grain, that is, the dose that I did use; I don't use it now.

Q. And for what particular purpose or therapeutic action is that used? A. It is used to reduce blood pressure.

By Mr. Lyon:

Q. To produce or reduce? A. Reduce.

416 By Mr. Butler:

Q. And has it that effect? A. It has,

Q. Now, as to the character of nitrogen peroxide gas, as to whether it is poisonous or not. A. It is a poison.

Q. And capable of producing death? A. Yes, sir.

Q. Have you known instances of that sort? A. Yes, sir.

Q. Now, something was said this morning in the testimony of one of the witnesses as to the presence in very minute quantities of nitrites in the air, perhaps some articles of nature, articles of food, hams and vegetables were mentioned among them, celery, I think. Now, assuming that to be true, if, as a matter of fact, nitrites are in the air, we'll say in some minute quantities, how can it be that the adding of nitrites to flour in such quantities as here suggested will be injurious to health.

Judge Scarritt: We object to that as an argument and not a question of expert testimony.

The Court: He may answer.

To which ruling claimant then and there duly excepted.

A. The nitrites found in the air is a very minute quantity unless in a location where nitrites are produced, as in chemical laboratories. The proportion found in the air we breathe is so minute as to exert but slight influence, but it does exert an influence, it exerts a greater influence in very foggy weather than in clear weather, and in proportion to the density of the fog, we have a greater amount of the nitrite with a denser fog. They have a fog in London known as the "pea soup fog", which is very heavily charged with nitrites and produces the sense of suffocation and coughing and difficulty of breathing.

Q. Have you had to do with the examination of water for human consumption, the intestines of humans? A. Yes, sir.

O. For materials? A. Yes, sir.

Q. Now, as to the existence of nitrites in water from wells or supplies of water used for human consumption, you may state whether or not that is considered an objection to the use of the water?

A. It is not only considered so, but it is positively in-417 jurious to use it, so much so that the boards of health of the cities using water from certain sources, if they find what is known as a heavy trace of nitrites in the water, the water is condemned and is not considered potable until it has been boiled.

0. That is not fit to drink until they boil it?

A. It is not fit to drink.

Now, as to the meaning of the word "trace" which you just used, does that calculate to indicate a measurable quantity,

or a quantity so minute as not to be measurable?

A. It is a very minute quantity, but still measurable under modern methods of measurement, but the rule of the departments is simply that where there is a heavy trace, meaning a minute quantity, the water is condemned and is recommended by the health authorities to be boiled in order to avoid sickness.

Now, what is the effect of nitrites found in-by the way, what is the source of nitrites in the vegetable or organic matter such has food and meats, and the like?

A. It is found as being present when decomposition commences, and decomposition commences very rapidly after death.

And as to the quantity containing decomposition, the quantity of the nitrite reacting material, or nitrogen peroxide gas, how does it compare with the degree of decomposition?

As decomposition increases there is a greater quantity

of the nitrogen peroxide evolved.

Now, as to its presence in articles of food, like meats, hams or other organic foods, what do you say as to the effect of the use of foods containing nitrites, like ham cured by smoking, and so forth, its digestibility and its effect upon the well being and the propriety of taking it when digestion is weak and feeble, and sick and so forth?

As I stated, the production of the nitrite depends upon decomposition. If decomposition is checked, as it is in the smoking of ham by the creosote, that stops the formation of the nitrites, and whatever of nitrite may be in the ham before the smoking checks the production, is deleterious, but the quantity taken in ham would be very minute as compared with that taken by the substance just mentioned, the nitrite of amyl, or when the result would not be marked, and then we do not eat the ham three times a day the year around.

Q. Now, as to injury to health resulting from the use of foods containing nitrites or otherwise adulterated or objectionable, state whether or not injuriousness may result from the continued use when the effect of the taking of a given amount is not measurable or observable or made manifest by symptoms or apparent well-being to the person taking it?

A. Those symptoms may not manifest themselves so as to be determined by an ordinary examination until after the material has been taken into the system for a long time. That may be likened, perhaps, for the purpose of illustration, to the taking of water which flows through a lead pipe; that may be taken for a long time before we have symptoms of lead poisoning, but it will come sooner or later.

Q. And now specifically as to flour or bread made from bleached flour, have you yourself heretofore considered in your practice and treatments respecting diet, considered the effect

of such bleaching?

A. I have and do so at this time.

Q. Now, have you had any experience or observation in hospitals or elsewhere in that regard? A. I have.

Q. You may state, what it is.

A. About twenty years ago my attention was directed to the condition of patients in the hospital with reference to the diet which they took. It was at that time, or about that time, that there was considerable discussion relative to the merit of patent flour, so-called, and I then began investigations in a practical way upon the subject, and my investigations were followed from time to time until I learned that the bleached flour was being used or introduced into the market, the con-

dition of digestion was what attracted my attention more particularly, and I instituted some experiments of a practical nature, and the result was that I came to the

practical nature, and the result was that I came to the conclusion that even the so-called patent flour is not as wholesome as the flour made from the entire kernel of the wheat. Reaching that conclusion I made arrangements with a mill to provide me with that flour alone, I mean flour made from the grinding of the whole wheat, and with the introduction of that flour into the hospital the improvement in digestion and in the general condition of health of the patients was very marked, so that as long as I remained in connection with hospitals and

even now, in my private practice, I require my patients to make use of that kind of flour, and not use the very white or patent flour so-called.

Q. Now, as to the observation of effect of flour containing the nitrogen peroxide gas as a result of the bleaching, has

your observation extended to that?

A. We have found on investigation that some of the flour which we have bought for use in the hospital had been bleached, and my attention was therefore called to the quality of the flour, and my observations, comparing that with the quality—with the flour from the whole kernel, led me to conclude very decidedly that the bleached flour was improper to use, and even the white flour, the patent flour.

Q. Unbleached?

- A. Resorted to the whole berry, it does not look as pretty, but it is a great deal more healthy.
- Q. Why is it that whole flour is—the whole content of the wheat, does that include bran and all? A. Yes, sir.
- Q. Is better than the unbleached, wholesome white patent flour of commerce?
- A. The reason is that the portion of the berry excluded in the making of a very fine white patent flour is a little brownish in tinge, lying next to the bran, that particular material which they take great pains to exclude in making a high grade white flour, contains a substance known as cerealine, which is a digestive element, and when that is removed the starch

of the berry is not digested so well as when it is permitted to remain; that cerealine changes the starch into

a material which is much more easily digested, which will easily absorb, and when that is excluded from the kernel, the wheat, you remove one of the elements that should be permitted to a person in order to carry on normal digestion.

Afternoon Session-Monday, June 6, 1910.

# Cross-Examination

By Mr. Smith:

Q. Doctor, did you ever examine any of the bleached flour in controversy in this case? A. No, sir.

Q. Did you ever examine any flour that was bleached by the Alsop process?

A. No, sir, excepting as remarked a little while ago, in comparing it with flour that I had in the hospital for the purpose of comparison, in relation to its digestibility.

Q. Well, when was that?

A. That was about twenty years ago.

Q. Well, did you have any bleached flour by the Alsop process twenty years ago?

A. No, no, no; no, I beg your pardon, you did not quite understand me, perhaps I did not make myself clear. My at-

tention was first called to the necessity of having a flour made from the whole grain about twenty years ago.

Q. Yes, that is all right.

A. And I said, as I investigated later, I found that there was a process of bleaching; I didn't know then whether it was the Alsop process or what process it was.

Q. Twenty years ago when you went to the whole wheat diet instead of the patent flour was that flour then bleached?

A. No.

Q. I mean was the flour which you discarded, namely, the patent flour, was that bleached?

A. No, not to my knowledge.

Q. No. Well, did you examine it to see whether it contained nitrites or not twenty years ago? A. No, sir.

Q. Sir? A. No.

- Q. Well, then, the fact is you discarded the patent flour twenty years ago and went to the whole wheat flour, not because it was bleached and thereby contained nitrogen or nitrites or nitrite reacting material, but because you preferred the whole wheat flour? A. That is correct.
- 421 Q. That is correct. That is what I thought. Now, this substance which you have denominated adulterous or deleterious or poisonous, is what has been referred to here generally as nitrites or nitrite re-acting material?

A. Yes, sir.

Q. You don't object to that simply because it is introduced into the system by way of the bread, do you?

A. I object to its being introduced into the system in any

form, I don't care what it is,

Q. Yes, sir, that is what I thought, that is what I thought you were not against it simply because it happens to be contained in fleur or bread? A. No.

Q. You would be against it no matter what form it is in-

troduced into the system? A. That is right.

Q. And do you understand that where bread is used as a conveyer, that it is not worse than though something else was used as a conveyer, if it goes into the stomach?

A. I don't think I understand your question,

Q. I say you object to nitrites, when bread is the conveyer, it takes it into the stomach, no more than you would than if something else was the conveyer, which took the nitrites into the stomach?

A. Anything which introduces the nitrites into the stomach in a quantity sufficient to make an impairment of health is, in my opinion, objectionable.

Q. Now, it is true, is it not, that nitrites are sometimes administered as a medicine through the stomach?

A. By some people it is,

Q. I think this medicine—this nitrite which you used, amyl nitrite, you inhale that, don't you?

A. Yes, sir, it is administered both ways, by inhalation and

by ingestion.

- Q. And when amyl nitrite is inhaled it is in the form of a little powder or berry, or something that is pulverized, taken through the nose?
- A. It is put into a little glass case, and in that glass case there is some three or five drops. When the material is designed that little glass record they are usually called in
- sired, that little glass pearl, they are usually called, is put into the handkerchief and crushed, and the material is inhaled.
  - Q. Yes, sir, that is in a very concentrated form, isn't it?

A. That is pure nitrite of amyl.

- Q. Yes, and you have it there in about as concentrated a form as it is possible for a chemist to get it, haven't you?
- A. That is the natural form in which it comes, it is not hardly concentrated nor diluted; it is the natural form in which it comes.

O. That is the pure stuff? A. Yes, sir.

Q. Now, is that what is regarded as an organic or inorganic nitrite? A. The nitrite of amyl?

Q. Yes, as you may have taken it through the nose.

A. Well, it would not make any difference whether it was organic or inorganic.

). Possibly, but I am asking just this-

A. If I understand your question correctly, the nitrite of amyl belongs to the group known as the alcohol groups.

Q. I still haven't got what I want you to tell me. Does it belong to a group that is called organic or inorganic nitrites?

A. Now, I don't know what you mean.

Q. I put it as plain as I can. Would this amyl nitrite which you have inhaled through the nostrils be regarded by chemists as an organic or an inorganic nitrite?

A. Well, I don't know that I have ever paid any attention to that sort of question, as to its being organic or inorganic.

- Q. In other words, you can't tell whether it is one or the other?
- A. It is a volatile material which entirely disappears after it has been released from the pearl, and evaporates wholly into the atmosphere just like chloroform.
- Q. Yes. Now, you don't know of your personal knowledge from any investigation you have made that there is any nitrite or nitrite re-acting material in this flour at all, do you?
  - A. Not from any investigation that I have made, no, sir. Q. And you don't know from any personal knowledge that
- there would be any of it in the bread, do you? A. No, sir.

  O. Nor anything about the amount of it? A. No, sir.

423 Q. You are simply assuming that it is true, and then you are giving your results based upon your general

knowledge? A. Yes, sir.

Q. Now, what is the medicinal dose that is given where it is administered as a medicine and given through the stomach; I don't care about its inhalation, I want where it goes through the stomach. A. Of what?

Q. Of nitrite. A. Nitrite of amyl.

- Q. No, of nitrite, I don't care what you call it, nitrite of anyl, or sodium nitrite, I don't care what it is, I don't care about where you inhale it, but if you are giving it to a patient through the stomach how much would be regarded as a medicinal dose?
- A. A dose of the nitrite of soda is in the books—it is put down as from one to three grains, but I never gave three grains because I reached results with one grain that satisfied me that three grains was too much.

Q. The United States Pharmacoepia lays down from one

to three grains as a medicinal dose, doesn't it?

A. Yes, sir.

- Q. Now, the amount of nitrite contained in this flour, as testified to, if reduced so as to ascertain the amount thereof in a loaf of bread, if my computation is correct, would show, that eating a loaf of bread three times a day, and taking two grains as a medicinal dose instead of three, as you give the limit, it would take a man just about one year, eating a pound of bread a day, to take into his system a medicinal dose, I simply mention this to show you something about how accurate the quantities are? A. Yes,
- · Q. Now, if I take into my system in some other form an amount of nitrite equal to that, it would do just as much harm, wouldn't it? A. Yes, sir.
- Q. Now, whether it is in its natural state or not, it is true, is it not, that in swallowing the saliva, we do introduce into our system nitrites, don't we? A. Yes, sir.
- Q. And it is true, is it, that we introduce into our system more nitrites than is contained, that is more nitrites in a day than is contained in a loaf of bread that I would eat;

124 is that not true? A. I don't know.

- Q. Don't you know the amount that is contained in the saliva?
  - A. I do not know the amount contained in the saliva.
- Q. Did you ever test any saliva to ascertain the presence of nitrites, and the amount?
  - A. I never examined it.
- Q. You never did. Now, don't you know that it is true that the amount of nitrites contained in the saliva is in many instances twelve times as much as that contained in the flour.

A. No, sir, it is not, according to my reading.

Q. Well, you never made any examination of it, did you?

A. No, sir.

Q. A person who made the actual test could tell better, couldn't he? A. Possibly he could.

Q. Now, it is true, is it not, that nitrites are found at all

times in the saliva of all people, is that not true?

A. Yes, sir, to a certain extent.

Q. Then from infancy up to old age a person is constantly taking into his system in the form of saliva the same nitrites which are contained in this bleached flour; is that not true?

A. Yes, sir.

Q. Now, are we to understand that according to your judgment human life is shortened and health impaired because of that? A. Because of what?

Q. Of the taking of nitrites into my system in the form of

saliva?

A. I believe that the nitrites impair the health in the system in whatsoever quantity they may be taken; of course, if they were very, very minute in quantity, the conditions of repair going on in the system of a healthy man replace it, it is immaterial, that it has been destroyed, and so a very minute quantity is eliminated, but where that same material is introduced in a certain proportion, three times a day, right through life, you finally reach results which are injurious.

Q. But if it is true that nitrite is contained in the saliva in quantities greater than contained in bleached

flour, and that the average person is swallowing the saliva three or four or five times a minute, he is constantly from youth to old age taking into the system the same substance, and in quantities equal or greater to that which these parties claim is in bleached flour; is that not true?

A. Yes, sir; on your assumption.

Q. Doctor, I am simply assuming that, it is the same form of nitrite, isn't it?

A. Oh, yes, sir.

Q. And the results would be just as harmful whether taken in the form of saliva or taken in the form of bread, the amount being equal, would they not? A. Yes, sir.

Q. Now it is true that every physician recommends to his

patient thorough mastication of food, don't you?

A. Yes, sir, I suppose they do; I do.

Q. You do, and by a thorough mastication of his food you mean the mixing it fully with saliva, don't you?

A. Yes, sir.

Q. And yet the nore thoroughly it is mixed with saliva, the more of these nitrites he is taking into the stomach, isn't he? A. No.

Q. Isn't it true that the more saliva you take, the more nitrites you get?

A. No, because the saliva does not [execrate] nitrites; the saliva from the salivary gland itself does not contain nitrites.

- Q. However, it is through the bacterial action, of what takes place, I mean?
  - A. They are introduced from that.

Q. All right.

- A. And are produced in the mouth outside of the salivary glands, so that the more saliva that is [execrated], as you masticate food, the less nitrites you have to swallow.
  - Q. Total amount?

Less, the total amount would be less.

Q. Let's take a person who smokes, for instance, now that accelerates the amount of saliva, that is, some, doesn't it.

A. In some people and in some people it checks it.

Well, let's take those where it accelerates it, this saliva comes in contact with whatever may be in the mouth and bacterial action takes place, does it not?

A Yes, sir.

Q. And would not the amount of nitrites in the stomach be increased by that?

A. To the extent of the nitrites that were taken into the stomach, but as I say, the nitrite is not [execrated] by the salivary gland,

Q. I understand you said that, you don't need to repeat that unless you want to, but the amount of nitrites that would be taken into the stomach would be increased by this increase of the flow of saliva due to saliva, would it not?

A. No, sir, it would not.
O. Would it be lessened?

A. In general effect it would be lessened, because there would be an increase of flow from the salivary glands and no nitrites coming from the salivary glands, the quantity, the residual quantity in the mouth would be lessened, and the amount swallowed would be lessened.

O. But is true or is it not true that the more saliva you have, the more nitrites you have?

A. No, sir, that is not true.

Q. But it is true that the more you have the less you have?

A. Not put in that way. As I said before, the nitrites are introduced from the outside. Now with the increased flow of salivary juice you would, so to speak, wash away the nitrites that have been formed in the mouth, and if the flow was increased, you would have a lessened quantity in the mouth to swallow; that is what I want to make clear, pardon me, let me put it this way, if you please.

Q. All right.

A. If the salivary glands secrete or excrete the nitrite then with an increased flow from the salivary glands, you would have increase of nitrites, but they do not secrete nitrites.

Q. How do you account for the presence of nitrites in the mouth of a little child, a little baby?

A. Come from the outside.

Q. Well, outside of what? From the atmosphere or from nitrites in the atmosphere.

A. Or from something that has been put into its mouth.

- Q. Take an infant child that is nursing at its mother's breast, how do you account for the presence of nitrites in its mouth?
- A. The microorganism in the mouth of the child liberates the nitrites.
- Q. And it was not present there in the mouth of that infant child, wasn't it? A. It is.
- Q. And when it swallows it takes them into its stomach doesn't it? A. Yes, sir.
- Q. Now can you tell the jury whether or not the amount of nitrites which an average person, adult, takes into the stomach, daily, in the form of saliva, equals or exceeds the amount taken in if he eats a pound loaf of bread made from this flour?

A. I am unable to give a comparison, because I never have

investigated that.

Q. Now have you ever examined food products to determine the presence of nitrites in them?

A. Not by any chemical methods; I am not a chemist; I make no pretensions whatever to a knowledge of—

Q. You have made a study of foods, haven't you?

A Yes, . r.

Q. Well, in all your study of foods, did it never occur to you, to make an examination of a particular product to determine the presence of nitrites?

A. I have examined of foods with reference to any substance which might be contained therein which I considered

deleterious to health.

Q. All right. What ones did you examine then to determine the presence of nitrites?

A. More particularly canned goods.

Q. What in the way of meats?

A. No meats.

Q. None? A. No.

Q. Why not?

A. Because I didn't think it was necessary.

Q. You were looking for these things which might be deleterious to health, were you not?

A Yes, sir.

Q. And didn't you regard nitrites as deleterious to health?

A. Yes, sir.

- Q. Then why didn't you examine the meats to see if they were present?
  - A. Because I did not give decomposed meat to my patient.
- Q. Let's take smoked ham, you use that in the family, do do you not?

A. Very, very little.

428 Q. Why so?

- Because I don't think it is healthy as other forms of meat.
- Q. Are we to understand that in your-judgment smoked ham is a deleterious food product?

 It is difficult to digest, and so I consider not useful, as useful as other forms.

Q. Do you understand that in your judgment smoked ham is a deleterious food product because it contains nitrites?

A. Yes, sir, it would be if used as we use bread.

- Q. Yes, sir, then if bread containing nitrites is deleterious, ham which contained nitrites is equally deleterious, is it?
- A. If used in the same amount and containing the same quantity.
- Q. Well, it is deleterious irrespective of the amount it contains, is it not? A. Which?

Q. Anything which contains nitrites?

A. Anything that contains nitrites is delerterious to health, but we must take into consideration the quantity ingested.

- Q. Yes, If the amount which is contained in a pound of smoked ham exceeds the amount which is contained in a pound of bread made from this bleached flour, then the pound of ham would be more deleterious than a pound of bread, wouldn't it?
- A. Yes, sir, but as I said before you don't use a pound of ham three times a day in your life.

Q. You don't use a pound of bread three times a day?

 A good many use a pound of bread, come to more than a pound of bread.

Q. It may differ in degree but not in kind?

A. The nitrites are all in kind but differ in degree.

- Q. Did you ever make an examination of meat to see whether it contained nitrites? A. No.
  - Q. Did you ever use bacon in your family?

A. Yes, sir.

Q. Now you have an examination of food products to see whether or not they contain anything which is deleterious?

A. I have

Q. Did it ever occur to you to examine bacon to see whether or not it has nitrites? A. No.

Q. If it does contain nitrites it is just as deleterious as bread which contains nitrites, isn't it?

A. If in the some quantity, yes.

Q. And if in a greater quantity then it is more dangerous, isn't it? A. Yes, if it contains more.

Q. Did you ever examine corn starch to see if it contained nitrites? A. No, sir.

Q. Do you ever use that in your family?

A. Yes, sir.

Q. How does it come you never examined that?

A. I didn't think it was necessary.

Q. If it does contain nitrites it is equally injurious with bleached flour, is it not?

A. Anything that contains nitrites is injurious and the

more nitrites the more injurious.

Q. If the air you breathe contains nitrites it is injurious to health, is it?

A. Yes, sir, it has sufficient nitrites in the air to kill a

man.

Q. Now in your practice doctor, covering a great many years, have you ever had a patient whose case you diagnosed as being nitrite poisoning due to nitrite contained in the food he had eaten? A. No.

Q. In all your practice as a physician have you ever known a person who is suffering from nitrite poison due to the nitrites contained in anything he had eaten? A. No.

Q. Did you ever hear of a person in medical journals or otherwise, in your profession, where any person was suffering from nitrite poisoning due to nitrites contained in the food he ate? A. Yes.

Q. Where was that?

A. In the hospital of which I had charge.

Q. That is twenty years ago?

A. No, that is less than 20 years ago.

Q. Let us know something about that; where was it?

A. In the Norman Hospital for the care of insane, Q. Did you have any personal knowledge of that?

A. Yes, sir, it was one of my own patients.

Q. Was that a patient who was suffering from nitrite poisoning due to what he had eaten in the way of foods?

A. Yes, sir.

Q. What was the food? A. Sausage.

430 Q. Sausage? Λ. Yes.

Q. Well did you diagnose it as due to the nitrites in the sausage?

A. In the post mortem examination we did.

Q. Did you before?

A. We suspected but we couldn't tell.

Q. Did you ever have another case under your observation? A. Of what kind?

Q. Of a person who was suffering from nitrite poisoning due to the foods he had eaten?

A. Not that I am aware of.

Q. Did you determine that the nitrites in that next case was due to the nitrites in the sausage? A. Yes, sir.

Q. Was that a case of what in ordinary experience we call

ptomaine poisoning?

A. It was different from what we ordinarily speak of as ptomaine poisoning, much more severe.

Q. Much more severe? A. It ended in death.

Q. Now has there ever been a case within your personal experience where a person eating food, outside of these cases you have mentioned, of sausage, where a person eating any kind of food has contracted a case of either acute of chronic nitrite poisoning? A. Yes.

Q. Where was that?

A. In my practice and in hospitals, as I stated, perhaps I did not make myself clear in my investigation with reference to the use of foods, I came to the conclusion that the bleached flours that we are getting, after I found out that it was bleached, acted deleteriously as a poison, to use your words, and stopped the use of them.

Q. And when was that?

A. Because of the effect it produced upon the health of the patients; when it was stopped and other material was [—] the patients began to gain.

Q. When was that, doctor, that was 20 years ago?

A. Yes, sir.

Q. You don't know that flour was bleached 20 years ago?

A. No, not 20 years ago, 1 didn't say, 1 beg parden if you thought 20 years ago.

Q. I said 20 years?

 I didn't hear you; I thought you said 10 years ago.

431 Q. How long was it? A. About ten.

Q. Did you know of bleach 10 years? A. Yes, sir.

Q. How was it bleached? A. I don't know.

Q. Have you ever examined to see whether it was bleached?

A. No.

Q. Did you ever examine it to see whether it contained nitrites? A. No.

Q. Well, then why do you say it was bleached?

A. Because I was told it was.

Q. Well, then that is all you know about it, somebody said it was bleached? A. The miller who produced the flour stated that there was a method now of bleaching flour, and it was suggested to me that as we used about five barrels a day, that that flour could be sold to us at a cheaper rate than patent flour, and notwith-standing that fact I discarded that bleached flour, and had the flour made from the whole kernel of the wheat, as stated.

Q. You discarded patent flour twenty years ago, didn't you?

A. I did, yes, sir.

Q. And were your objections to the patent flour on the same

ground as your objections to this other flour?

A. No, I objected to patent flour on the ground that certain parts of the kernel of wheat are removed in the process of making patent flour, which are wholesome, and are needed as an aid to digestion.

Q. Well, I didn't know but you and I would agree on that, that the whole wheat flour is probably better than any sort of

patent? A. Oh, I know it is.

Q. Whether it is 40 per cent or 75 per cent, but what I was trying to ascertain, doctor, was whether or not you have ever had a patient under your observation who had poisoning of the kind diagnosed as nitrite poisoning, due to the nitrite contained in anything he had eaten?

A. Except as I stated, no.

Q. Now isn't it true that there are many substances which if taken in sufficient quantities produce harmful results, but which if taken in very diluted form or very small quantities produce either no result at all or else produce a beneficial result; isn't that true?

A. I don't know of any harmful material, if taken in minute quantities and for long periods of time at all, can be benefi-

cial.

Q. Well, if I take into my stomach half a pint of ordinary table salts, it would produce very disagreeable results, wouldn't it, and probably kill me, isn't that true?

A. No, I don't think it would kill you.

Q. Well, it would produce a very grave disordered condition of my stomach, wouldn't it?

A. No, it would make you vomit and you would get rid

of it.

- Q. Well, do you want the jury to understand that no harmful results would come if I took into my stomach half a pint of salt, [rather] than to make me vomit?
- A. Well, the effect of the vomit might be very harmful, for it might produce a spasm, but as far as any ulterior harm is concerned, there would be very little, if any.
  - Q. But if I take a small amount of salt it does me good?

A. Because it belongs to the system, is a part of the system, and a person could not live without taking a certain amount of salt,

Q. Is nicotine a part of the system? A. No, sir.

Q. How much nicotine could I take without its producing death?

A. That depends on the individual's ability to resist the encroachment of the nicotine poison; some can use a good deal and others can use but very little.

Q. Now, there isn't any person but what if you put into their system either hypodermically or otherwise, a sufficient amount of nicotine it would kill them? A. Oh yes,

Q. And yet, if I smoke a cigar, do you say that that is

producing the same results, only in a smaller degree?

A. Yes, sir.

Q. So that can be taken as a fair test of your entire line of reasoning, that since if I take a sufficient amount of nicotine, it will kill [you], therefore if I smoke a cigar, it is killing me to that extent; is that right?

A. It is injurious, there is no doubt about it.

Q. To a certain extent, and the same system of reasoning is applied by you in the dealing with bleached flour which contains nitrites as you use in dealing with nicotine?

A. Yes, sir.

Q. In other words, if I take enough of it, it will kill me?

A. That is right.

- Q. Therefore, if I take any of it, it will kill me to that extent? A. Yes, sir.
- Q. And the nitrites which I take into my stomach in the shape of smoked meat or bacon or of any other food product, is exactly the same kind of nitrite which I take into my system in the way of bleached flour? A. That is right.
  - Q. And if it is injurious in one, it is injurious in the other?

A. That is true.

- Q. And if it is not injurious in one, then it is not injurious in the other, isn't it? A. That is correct.
- Q. Can you remember the time when the human race has not been eating smoked meat? A. I do not remember it.
- Q. Can you remember the time when the human race has not been eating bacon? A. No.
- Q. And you sure can not remember the time when individuals have not been taking nitrites into the system by way of saliva, can you? A. That is true.
- Q. And it is always the case that we are taking it into our system when we inhale the air, isn't it?
  - A. Yes, sir, in a very small extent that is true,

- Q. Now the rain which falls and goes into the cistern, as the rain comes through the atmosphere it takes up particles of nitrite and takes it into the cistern water doesn't it?
  - A. That depends on whether the water has been boiled-
  - Q. I say the rain as it falls from the clouds and runs into the cistern?

434 A. Cistern?

Q. Yes, when it gets into the cistern?

. I thought you said "system".

Q. It has nitrites in it, hasn't it? A. Yes.

Q. Now by running that rain water through a filter to draw it into the kitchen sink, will abstract the nitrites from it?

A. Not all of them.

Q. Then if I use that cistern water I am taking nitrites into the system, am I not? A. Yes.

Q. The same kind of nitrites as if I use bleached flour?

A. Precisely.

Q. And if bleached flour will tend to kill, these others will do the same thing, won't they? A. Yes, sir.

Q. One just as bad as the other? A. Just exactly.

Q. And one is no worse [that] the other? A. Not a bit.

Q. So you place the nitrites that are contained in the human saliva, the nitrite in the air, the nitrite in the water, the nitrite in the bacon, the nitrite in ham, and the nitrite in bleached flour all in the same class?

A. It is all nitrite.

- Q. Yes, and one is just as good and just as bad as the other? A. Yes, sir, and its effect.
- Q. And the effect on the human system would be just the same if taken in one form or the other?

A. Yes, sir, depending on the quantity taken.

Q. Now I believe you said you never made any examination of the bleached flour yourself? A. No, sir, I did not.

Q. You never made any examination of any bread from

bleached flour? A. From what?

Q. Bread from bleach flour, you never made any examination of it? A. You mean a chemical examination?

Q. Yes, yes. A. No, sir.

Q. Now you speak about the action of this nitrite when taken into the system, coming in contact with some of the particles of the blood, and the effect it has on them.

Do you know what would be the effect upon the blood if ozone were introduced into the air and inhaled in the lungs?

A. Yes.

Q. How would that effect compared with the effect which you have described as resulting from the taking of nitrites into the system? A. It is almost the opposite effect.

Q. What is the effect which you found from the taking of

ozone?

A. That depends of course, upon the extent to which it is diluted, ozone is an element which is not to a certain extent healthy, if it is taken in great quantities it would be harmful.

Q. What would be the effect if taken in great quantities,

harmful in what way?

A. It would produce a disturbance in the circulation.

Q. And would not that disturbance be exactly the same as that which you described from the taking of nitrite into the system? A. No, sir.

Q. What would be its effect? A. What effect?

Q. Taking the ozone in large quantities?

A. The immediate effect would be a sense of suffocation, causing an irritation in the throat, an irritation of the lungs.

Q. Is the sensation what you describe as the result from the nitrites?

A. After that is removed that is the end of it.

Q. There is one question, I don't know whether you made it clear or not. This sausage that you found produced death in this person. Did you examine that sausage and examine the amount of nitrite or nitrite reacting material there was in it?

A. Not as to the quantitative, but to find out that it was

there, yes.

Q. But you don't know anything about the amount of it?

A. No, sir.

Q. And that was how long ago?

- A. To the best of my recollection that is about 15 years ago.
- Q. How did you test it to determine the presence or absence of nitrites?

A. In the laboratory connected with the hospital there was a case of re-agents, and the material for determining the test was prepared there and made from it as the test is ap-

plied here to flour, that is the color test,

- Q. But now as a matter of fact didn't you at that time diagnose that at the time as a case of ptomaine poisoning?
- A. No, sir, the symptoms were all so different from ptomaine poison, and we were unable to determine just what the condition was, as I say, until after the post mortem was made.

Q. Where had this sausage been?

- A. Where had it been kept? It was sent to the party from her home.
  - Q. How prepared, how packed?
  - A. It was sent in a box with some bread and cake.
- Q. Can you give me the name of this miller from whom you got bleached flour ten years ago?
  - A. No, I can not, the mill was located in Omroe, Wisconsin.

Q. You did not examine any of this flour yourself to see

whether it contained nitrites? A. No, sir.

Q. And you don't know anything about how it is bleached, or where it is bleached, or the process by which it is bleached, or anything else upon the subject?

A. Only as I was telling.

Q. You were not told that he had an Alsop bleacher there?

A. No, sir.

Q. And you simply have no knowledge of that? A. No, sir.

Q. And you made no examination of the flour to ascertain whether or not it did contain nitrites or not? A. I did not.

## Redirect Examination

By Mr. Butler:

Q. The Alsop process seems by this evidence to have been patented in the year 1904—I think, Mr. Elliott, do you remember the date, 1904, is that the date?

Mr. Elliott: I think so.

Q. Do you know whether this incident that you refer to with the miller at Omroe was before or since that date?

A. I could not fix the date positively.

Q. Well, I know, but you said it was about ten years ago. Now the patent we have, called this an improved process, and it is 1904, and I suppose the point Mr. Smith is driv-

437 ing at was that this was before the Alsop process. Now I would like to, if you can, tell me according to your recollection whether or not this incident occurred with this miller before 1904 or since that date; 1904 would be six years

ago, in May, this thing was patented?

A. My impression is it was before.

Q. You think it was before? A. Yes, sir.

Q. Mr. Smith in one of your questions, Dr. Kempster, you said that the United States Pharmacoepia gave the dose of nitrite of sodium at from 1 to 3 grains?

Mr. Smith: The witness said, I asked him what he gave, and he said from one to three.

The Court: He asked what the national pharmacoepia gave it.

Mr. Butler: I understood Mr. Smith to say from one to three.

The Court: Well, he put it perhaps.

Q. I want to call your attention—this is the book you refer to, isn't it, it says the average dose is one grain.

Judge Scarritt: I object. Mr. Butler misquotes Mr. Smith.

Mr. Smith: I have to say that I am not familiar with the United States pharmacoepia. I simply know what these doctors tell.

The Court: What is that book?

By Mr. Butler:

Q. This book is labeled "The Pharmacoepia of the United States, Eighth Decennial Revision," and it was revised in 1900 by authority of the United States Pharmaceutical Convention, held at Washington, A. D. 1900.

Mr. Lyons: Revised two or three years ago.

By Mr. Butler:

Q. And I will ask you if you know whether that is the latest edition and whether it does not give the average dose 65 milligrams, one grain, equal to one grain, as the average dose, I think?

A. Yes, sir, this is the United States Pharmacoepia.

438 By Judge Scarritt: He asked if that was the last revision.

By Mr. Butler:

Q. Yes, is it the latest edition or do you know about that?

A. I don't know that there is a later edition; there could not be a later edition because it is only revised, I believe, once in ten years.

Q. So there would be another one about due now?

A. Yes, sir.

Mr. Butler: About ten years old.

By Mr. Scarritt:

Q. They have supplements, however, do they not, doctor?

A. Beg pardon.

Q. They have supplements they send out supplements making changes in the formulae.

By the Court:

Q. Send out leaflets and supplements, something of that kind? A. Yes, they do, yes sir.

By Judge Scarritt:

Q. You don't know whether they changed that average dose in these supplements or not, do you?

A. No, I do not.

Judge Helm: I understood—I have the notes here—that the witness testified that the dose prescribed by physicians

was from one to three grains, and then Mr. Smith asked him if that was the dose prescribed by this book, and he said it was.

Mr. Butler: He said he never prescribed more than one grain.

Judge Helm: But he said that was the average dose, the dose used.

Witness: I stated it was given in the books from one to three grains, but I personally had never given more than one grain.

439 By Mr. Butler: (resuming)

Q. Does the injuriousness of taking nitrites increase

as the quantity increases? A. Yes, sir.

Q. The injuriousness increases as the quantity increases. Are there many foods which are injurious which do not directly produce death, are there many foods which are unwholesome, or adulterated, or injurious, which do not directly produce death like a dose of poison?

A. They produce symptoms which indicate that the system is being affected injuriously by the ingestion of the

material.

Q. Why is it that decomposing food in which increasing quantities of nitrites exist as decomposition progresses, is not a good food, or is an injurious food; you have testified that it is injurious; now tell why?

A. Because the increased liberation of the nitrites increases the quantity of the poison that is absorbed and as decomposition increases, the quantity of nitrite increases.

By the Court:

Q. What do you mean, an over-ripe bannana has got more nitrites in it than a fresh one? A. Yes.

Q. Or over-ripe apples?

A. Or, what is more to the point, a ham which is spoken of as a little strong, meaning that there is some decomposition in the ham, contains more nitrites than a ham that is fresh.

By Mr. Butler:

Q. How with respect to stale, unpreserved vegetables, such

as are found in markets, sometimes?

A. My judgment is that the amount of nitrite in fresh vegetables is very small, I think it is a very limited quantity, and probably attached to the vegetables on account of the soil in which it is raised, and does not come from their air, or from other sources, unless it has been washed in water that is impure, containing nitrites.

By the Court:

Q. Just one matter, I would like, for my own infor-440 mation, and curiosity, nothing to do with this case. You speak of a certain grade of corn meal fed to Italians? A. Yes, sir.

Q. Is that in the books or did you learn that from his-

tory?

A. I learned that from personal observation, and it is in the books, the Italian government has now created a commission to prevent the consumption of maize meal made from corn.

Q. What kind of corn?

A. It is the kind of corn they grow there; it is an inferior quality to ours, decidedly.

The Court: Well, I will not pursue it. I occasionally get a thought here myself.

Hamilton Pope Jones, was called as a witness, and having been duly sworn, testified as follows:

## Direct Examination

By Mr. Butler:

- Q. Where do you live, Dr. Jones?
- A. New Orleans, Louisiana.
  Q. What is your profession?
  A. I am a practicing physician.
- Q. Will you state fully your work of preparation and education and professional experience, as well in public as in private affairs affecting subject matters related to your profession?
  - A. I graduated in medicine from Tulane University.

Q. That is at New Orleans?

A. New Orleans, Louisiana, in 1894. In 1897 I had charge of the yellow fever hospital in New Orleans. In 1898 I took part in the active compaign in Cuba. After the necessity for surgical work stopped, I had charge of a large field at a yellow fever hospital there. In 1905 I had charge of the yellow fever hospital again in New Orleans. I was for a

number of years assistant to the Professor of Chemistry, Medical Jurisprudence and Toxicology at Tulane

University, and from 1894 until 1907 I was Administrator of Chemistry in the Medical Department of Tulane University. Since that time I have changed my branch of teaching to that of clinical medicine and diagnosis during my work in the wards of the Charity Hospital at New Orleans. For about a year and a half I was chemist in the State Hospital, known as State Analyst, and for the past eight or nine months I have been Food Commissioner of the State of Louisiana. In addition to which I have a general practice.

Q. Your time is not wholly given, then, to your official work? A. No.

Q. You are an officer of the State Food Department, as well as a teacher in the Tulane University. Is that the State

University of Louisiana?

A. Tulane University is an endowed institution. It was under another name formerly, a state institution, and there is a question as to whether it should receive state support or not. It does not as yet.

Q. In addition to your work as official teacher in the University, you also engage in general practice of medicine

at New Orleans? A. Yes.

Q. Have you had any special work in the matter of the study of water and foods? A. I have.

Q. Will you give the extent of that?

A. As State Analyst I had to examine a great variety of foods, and inasmuch as the water supply of the state of Louisiana had never been thoroughly studied, I undertook to make a more or less comprehensive examination of the water supplies of the various cities and towns throughout the state. In addition to that my attention was particularly drawn to contamination of waters by the death and destruction of fish in various bodies of water throughout the state, coming about as

the result of the death and decomposition of low forms

442 of vegetable life called algae.

Q. What is that, sea-weed, or something like that?

A. It is a vegetable plant, small plant—different varieties. Q. Are you familiar with the substance known as nitrogen peroxide gas? A. I am.

Q. And the nitrites from the combination of that gas, nitrous acid, with organic and inorganic matter? A. I am.

Q. Have you made any particular studies or investigations for the purpose of ascertaining whether or not nitrites are to be found in vegetable and animal bodies as a normal constituent, or otherwise? A. I have.

Q. Will you detail to the jury your investigations in that regard, and the results arrived at?

A. So far as the vegetables are concerned that I speak of now, I thought that the fairest test should be made upon vegetables procured in the markets of the city, so I procured some thirty varieties of staple vegetables, including roots, turnips, potatoes, sweet potatoes, lettuce, celery, cabbage, beets, radishes a great variety, and pumpkins, bananas and apples—some thirty-odd in number. I examined the exterior of these vegetables for nitrites and also the interior for nitrites, and the results of my conclusions are that it frequently happens that if the vegetable is grown in soil that contains decomposing organic matter like fertilizer, together with nitrifying bacteria.

that the surface of the root or the plant may contain nitrites, or may have nitrites on it, but careful sections of these vegetables made in such a manner as to preclude the possibility of a nitrite from the surface getting onto the interior—for instance, being carried across by a knife,—taking precautions against that, I find that no vegetable in its interior structure contains nitrites, unless that vegetable be in a state of decomposition. If the vegetable is decomposing or rotting, it may get nitrites

in its interior, but never under any other circumstances.

Q. Did you enumerate all the vegetables you examined?

A. I did not.

Q. Have you a memorandum by which you may refresh your recollection and make a complete specification of those that

von did examine?

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A. Parings of the vegetable surfaces were used while, as I said, adequate steps were taken to protect the interior of the vegetable substances examined from contamination from the outside.

Take celery: Outside of the root. Inside of the root, nega-

tive. Outside of the stalk, negative.

Q. When you say negative, you mean no nitrites?

A. I mean no nitrites. Now, you must, in order to understand this, realize that farmers, in preparing their vegetables for market, are more or less careful. Some of them thoroughly cleanse and wash their celery and other vegetables, and if they are washed thoroughly and carefully, you may get a negative result on the surface of the root, but in none of the cases did we get a nitrite reaction for the interior.

Turnips—a variety of that is rutabaga roots: Outside of root, covered with soil, positive; inside of the root, negative.

Q. What does "positive" mean?

A. Gave reaction for nitrites. Kohlrabie, another variety of turnip: Outside of the root, above the ground, negative reaction for nitrites; inside of the root, above ground, negative reaction for nitrites. Turnips: Outside of root, faint reaction for nitrites; inside of root, negative.

Cabbage head: Outside, negative reaction for nitrites; in-

side, negative reaction for nitrites.

Mustard Greens: leaf: Negative reaction for nitrites.

Spinach, outside of root, faint reaction; inside of root, pink coloring matter dissolved by acetic acid of the same strength as that which we use as a test for nitrites, consequently, as this pink coloring is dissolved by the acid, this test

is of no value on the pink portion of spinach, because you cannot tell whether the pink color is due to the dissolved color made in the acid, or to the nitrite action.

The nitrites may be present, but they don't show, and the test is of no value.

Lettuce, outside of leaf: Negative reaction; inside of leaf, negative reaction.

Cauliflower head, outside, negative reaction for nitrites; inside, negative reaction for nitrites.

Squash, outside, negative reaction for nitrites; inside, negative reaction for nitrites.

Egg plant: Outside, a little spoiled, positive reaction for nitrites. That was crude egg plant beginning to spoil, but the inside sound portion gave negative reaction for nitrites.

Pumpkin, outside, negative reaction for nitrites; inside, negative reaction for nitrites.

Sweet Pepper, green; Outside, negative reaction for nitrites; inside, negative reaction for nitrites.

Ripe banana; Outside of rind, negative reaction for nitrites; inside of fruit, negative reaction for nitrites.

Potatoes, young new potatoes; Outside, faint reaction for nitrites; inside, negative reaction for nitrites,

Half grown potatoes: Outside, positive reaction for nitrites; inside, negative reaction for nitrites.

Full grown potato: Outside, positive reaction for nitrites; inside, negative reaction for nitrites.

Sweet potatoes: Outside, negative reaction for nitrites; inside, negative reaction for nitrites.

Carrots, root; Outside, negative reaction for nitrites; inside, negative reaction for nitrites.

Radish, root; Outside coloring matter dissolved by acetic acid in various strengths from the strongest down to the strength used in this measure. The coloring matter is dissolved in acetic acid, consequently the test is of no value. The

same is true of the beet root, which gives a pink color. Acetic acid dissolves out the coloring matter.

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Parsnips, root: Outside, negative, inside, negative. take particular trouble to explain this dissolving of coloring matter because you have to discard the matter of tests for nitrites in any vegetable that contains pink coloring matter:

Onion, root; Outside, negative reaction for nitrites; inside, negative reaction for nitrites.

Artichoke; root:-that grown in the ground, outside, positive reaction for nitrites; inside, negative reaction for nitrites.

I took in addition to these a number of flowers, such as rose, different varieties of rose, different varieties of sweet pea, gladiolas, and several other pink varieties of flowers, and I found that coloring matter of all vegetables is soluble in acetic acid of the strength of the Gries-Ilosvay method.

That is the name of the gentlemen who got up the test?

A. Yes, Gries-Ilosvay-two names.

Now, I notice in some instances, in case of the analysis made of these various vegetables, you found the test to give positive or affirmative results on the outside? A. I did.

What is your explanation of that?

My explanation is this: That organic matter, such as leaves, fertilizer, manure, things of that kind, indicate decomposition and preparation for being turned into a food substance by a great number of bacteria under the general family name of sapraphytes, to which belong several families of bacteria that produce nitrates and nitrites. They are called nitrifying bacteria. Now, if the organic material in the soil is undergoing decomposition, all of these nitrifying bacteriaof course the soil that is on the root, when the root is pulled from the ground, is going to contain nitrites which will give the reaction, but under no circumstances are the nitrites ever

found in the interior live part of the plant.

Q. As to meats, have you made any examination of, or 446 have you any special knowledge with respect to the presence of nitrites or nitrite reacting material in meats?

I have examined fresh meats of different varieties. mean beef, mutton, fish, live and shell fish, and I have never found nitrites present in any fresh meat of any variety.

Q. Now, as respects cured meats, like smoked ham which has been mentioned. Have you made examination of them?

I have.

With what result? A. Find nitrites present.

Something has been said about the presence of nitrites in the saliva of human beings, adults and babes. Have you made any study of that subject? Tell us first what the fact is in that regard, and what are the sources of the nitrites so found?

A. I examined the saliva of some eighty individuals. I examined for instance, the saliva of every member of my particular section of the medical class which was in the ward at that time,-some 25 supposedly healthy young men. In addition to that I examined the saliva of young children, females, and a lot of people who were sick for various diseasespneumonia, dysentery, diarrhoea, typhoid fever, rheumatism, and a number of diseases I don't remember just at the moment. but at any rate, I attempted to examine the saliva of a large number of people who were both in health and in disease, and in varying degrees of age, strength and decrepitude. I examined the saliva from one child at the breast— a child of about seven months old. In every instance I found nitrites present in the saliva, and not a single instance did I find nitrites absent.

Now, in order to determine as to whether nitrites were a secretion of the salivary gland, the parotid gland, the sublingual glands, or whether they were formed of decomposing food in the mouth, I took a fine catheter and under proper precautions, I put this catheter into the duct of the parotid gland, just in the same way as a catheter is introduced into the bladder,

and withdrew the pure saliva from the parotid gland of seven individuals. Now, in no instance did I find nitrites present in the pure saliva juice. That is the first series of experiments.

Then I secured pure sub-lingual secretion from the sub-lingual glands of three individuals, uncontaminated by any secretion from the mouth, and in none of these instances did I find nitrite reacting material present. Fearing that the question might be raised as to whether a mixture of parotid gland secretion of the mouth and the sub-lingual gland secretion might not produce nitrite reaction, I secured parotid gland secretion pure from three separate individuals, and mixed them with the pure sub-lingual secretion from the same individuals, and in no instance with the mixed parotid and sub-lingual secretions did I get a nitrite reaction. In other words, it proved conclusively that nitrites do not come from those glands that secrete what we ordinarily know as saliva.

Q. You spoke of the parotid gland and the sub-lingual?

A. Yes.

Q. They are both in the mouth. One is above the tongue and the other under it?

A. The parotid has its opening in the side of the cheek; the sub-lingual has its opening beneath the tongue.

Q. Did you make any further examinations of secretions or excretions of the human body for the purpose of finding whether they eliminated nitrites—the urine and foeces?

A. I examined a number of freshly passed specimens of urine—some thirty in number, and found nitrites were not present in the urine. I examined freshly passed foeces from ten individuals, some of them with bowel complaint, in the female, typhoid fever—some of them in health. In no instance did I find nitrite reacting material present in the foeces.

Q. Now, doctor, to what do you attribute the presence of nitrites or nitrite reacting material in the saliva in the mouth of these eighty cases, we will say, that you have found? You say it does not come from the glands which secrete the saliva;

it is not in the saliva when taken directly from the gland; now, how do you explain that presence in the saliva, or find it large, so to speak in the mouth?

A. The mouths of all individuals, whether they are those of young infants without teeth, or older persons, contain the remains of particles of that which has been eaten. This indi-

cates decomposition; in other words, it rots in the mouth; and one of the effects of the decomposition or rotting of material containing—of organic material containing nitrogen, is the formation of nitrites. Protein, albumen, white of egg—all proteins or vegetables left in the mouth will decompose, and the extent of nitrite reaction with any given individual in my experience has been the degree of care with which that individual looks after his mouth.

Q. Now, with respect to the examination of water; are nitrites sometimes found in water—spring water, well water,

deep well water, etc?

A. They are sometimes found.

Q. And in such cases what is the source, or what are the

sources of nitrites so found? How produced?

A. As a rule, nitrites found in drinking water or surface well waters, and all waters except rain water, are the result of decomposition of organic material and indicate that that water is being actively polluted by something which may be decomposed—as a rule.

Q. Have you had any special experience with the discovery

of nitrites in water from various deep borings?

A. I have.

Q. Will you explain that and the sources of the nitrites there?

A. Well, you have nitrites possible in water from very deep wells from one of several sources. In the first place, if the water contains nitrates, nitrates may be reduced to nitrites by certain substances in the water; some iron salts, for instance, will do that. Then, you may have sealed up in the bowels of the earth organic matter that has been filtered through the sand or any other permeable material in the soil, and that may be preserved, just as you might have a can of

apples preserved; they will keep for a long time; only in the case of the water that lies very deep down, it

has been, you might say, canned for centuries, but the organic matter has not been in contact with the air, and with the particular varieties of bacteria which may decompose it, so that it does not show a nitrite reaction until after opportunity for that has shown itself. Then again, water from deep wells may be accidently contaminated by springing a well with a charge of nitro-glycerine, so that in the course of the work on the analysis of waters, we tried to get a history of the geological strata through which the well had gone, and the physical surroundings of the well, but in the absence of data at all, we condemn water that contains nitrites because it indicates that that water may have been contaminated from

organic sources—perhaps human excrements or urine—which has been decomposed, and that is always possibly accompanied by those germs which may cause disease—cholera, typhoid fever, Cochin-China diarrhea and diseases of that sort.

Q. You are familiar with the gas known as nitrogen per-

oxide gas? A. I am.

Q. And the salts known as nitrites? A. I am.

Q. You may tell us what they are, their characteristics as to being poisonous or otherwise.

A. You mean physical or chemical characteristics?

Q. What I am trying to get at is this: Whether nitrogen peroxide gas is a salubrious medium or a poisonous one.

A. Nitrogen peroxide gas is a poisonous gas.

Q. Now, as to nitrites, such as are found in decomposing organic matter and in the waters of wells and other sources of supply?

A. They are poisonous.

Q. What source or sources are there, if any, for the production of nitrites other than decomposition of organic matter and the electric spark or flaming are which was described in the patent of the Alsop process?

A. Other than those two?

450 Q. Yes.

A. You might have, under given conditions, nitrates reduced to nitrites.

Q. In addition to the two sources I have mentioned?

A. Yes. You may have bacteria which will reduce nitrates into nitrites as well as bacteria that will produce nitrites from decomposing food, making a final product which is called nitrates, which is the valuable fertilizing constituent that we get ultimately from manure and other things.

Q. Then it works both ways: Nitrites are nitrified by certain bacteria, and nitrates are nitrated so as to become in some

instances valuable as fertilizing material-is that it?

A. I don't catch that.

Question repeated in part as follows:

"Q. Then it really works both ways: Nitrites are nitrified by certain bacteria"—

Q. Nitrites reduced to nitrates by certain bacteria?

A. That is, you mean by being nitrified. The decomposition of organic matter, so far as nitrites formed are concerned, ultimately after the process is completed, results in the formation of nitrates which are valuable fertilizing constituents; but the moment that nitrate is reduced to a nitrite, it is a poison, both for animals and for plants, and no longer has properties of value as a fertilizer.

Q. Are waters containing nitrites approved for families,

or disapproved, and why?

A. If the source of the waters is not known, they are condemned, because the presence of nitrites is the hall-mark of decomposition in water; we don't know the origin of it; it contains nitrites, and we naturally suppose that that water has been contaminated with organic matter—bowel discharges or urinary discharges of people and of animals. Those people

may be ill with typhoid fever or some other disease, and the nitrites point the finger of warning that these

diseases may be contracted in that way.

Q. Nitrites are sometimes given for medicine?

A. They are.

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Q. Are you familiar with the effect of the taking of nitrites

into the stomach on the person who takes them?

A. The effect of nitrites taken into the stomach—the usual form in which nitrites are administered is sodium nitrites—is to reduce blood pressure, and if these doses are kept up for any length of time I found that the stomach becomes irritable and the digestion of the patient is disturbed. Nitrites are rarely given except to accompany certain specific things. They are usually given to break a very serious condition of disease in which we have to feel that the harm possible to be done by the nitrites is less than that of not controlling the particular condition of disease that demands their use. But one of the difficulties we have in administering nitrites is disturbance caused to digestion.

Q. What is the character of that disturbance?

A. Less of appetite, nausea, some vomiting, if persisted in.

Q. Now, with respect to the quantity required to cause observable disturbance, whether administered at one time or by a series of administrations, can you give us some view of that?

A. I have never used more than a dose of a grain at a time, but it is a usual rule that it is not possible to continue the use of the nitrite of sodium, say in a one-grain dose three or four times a day, longer than from eight days to two weeks. Some people have tolerance for it, but it is rare, and usually ends by upsetting the digestion.

Q. Do nitrites have any effect upon the blood?

A. They do.

Q. Will you describe that to us?

A. Nitrites have the power of uniting with the red coloring in the red blood cells, forming with them a definite compound, which compound prohibits the cell from doing its duty, that is, in carrying oxygen from one part of the body to the

other, and doing the other things it ought to do. It does not deprive blood of its oxygen per se, but the effect of the nitrites is very similar to nailing up the door of a street car and the street car, then, with the people in it, circulates around the tracks as a foreign substance neither doing anyone any good or performing its proper functions. It lacks the hemoglobin in such a way that it cannot carry the oxygen.

Q. But such effect does not require any particular quantity, to produce some such chemical change in the red corpuscles

of the blood?

A. If they are mingled. The peroxide nitrogen, you have to have a certain definite combining power with some red blood, so that the question of the harm done to the individual is directly in proportion to the amount of nitrogen peroxide taken by him.

Q. Is this action you refer to on the blood a direct ac-

to chemical laws?

A. It is a directly chemical action, and is as certain to follow, when these things are brought into contact with each other, as the law of gravity.

Q. Has the taking of nitrites into the stomach in food or

by other means any effect upon blood pressure?

- A. I have made observations with doses of nitrite of sodium of varying strength. I have found that the larger the dose the greater the effect, and as I diminished the doses on the same individual, that I had a proportionate diminution in the effect of the nitrites. There comes a time when the instruments are not delicate enough to record these varyings of blood pressure, but after the thing has fallen with the varying amounts given, proportioned according to a certain law, it is reasonable to suppose that no matter how small a dose you are going to give, you will have some effect from it—proportional effect.
  - Q. Have you made any examination of flour, bleached flour, containing nitrite reacting material? A. I have.

453 Q. And also of flour containing no such material? A. I have.

Q. Have you determined whether or not bread made from flour containing this nitrite reacting material will contain nitrites or not? A. I have, and found that it does.

Q. Now, as to the amount, in proportion to the amount in the flour and in a given amount of flour, would there be the same or a different amount in the bread made from the flour?

A. There would be less in the bread made from the flour.

Q. What relation, if you can give us some indication of that, according to your observation?

A. I have no definite quantitative determinations on that.

Q. The color is the means by which the test is made, I believe, in nitrites.

A. Yes.

Q. And it has been described, that certain standards are fixed, and the color of the specimen and the reaction procured from the specimen under investigation is compared with various standards? A. Yes,

Q. And in your examinations of the presence of nitrites in bread made from bleached flour, you did make a quantitative text? A. I. did not

tive test? A. I did not.

Q. Or compare with the amount in the flour used to make the bread? A. No.

Q. Now, as to the effect upon health—the consumption of food made from flour containing nitrites, can you give us any

information upon that?

A. Nitrites or nitrogen peroxide is a definite substance which has a definite power of combining with certain elements of the blood, and the effect upon the health will be directly in proportion to the amount of nitrites taken, no matter what the source of the nitrites may be.

Q. What is the character of that effect, whether benign or injurious? What is the character of the effect, good

454 or bad? A. Bad-injurious.

Q. And in the ways you have described—effect upon the digestion and the blood. Have you made any investigations to determine the effect upon digestibility of flour or food made from flour containing nitrite reacting material, as compared with flour or food made from flour containing none?

. A. I have not made them directly, but I supervised some others by checking some experiments made by Professor Mann

of New Orleans.

Q. Professor Mann is here, is he not? A. Yes.

Judge Scarritt: We object to that, if Your Honor please—what somebody else did.

Mr. Butler: I expect to call Dr. Mann. It merely goes to the order of proof.

Judge Scarritt: That makes it more objectionable.

Mr. Butler: It merely goes to the order of the proof, Judge Scarritt. My understanding is that sometimes matters require a foundation, and conclusions may be given if counsel is in good faith of the opinion that the foundation will be supplied, and I am of that opinion in this case.

Judge Scarritt: It is hearsay testimony, and it is not neccessary, because the witness who performed the experiment is here.

Mr. Butler: This witness superintended it, Judge Scarritt.

Judge Scarritt: That don't make any difference; it does not give him any personal knowledge, except the conclusions he might have drawn.

Mr. Butler: We will not call for the details.

Q. From your study and observation have you been able to form an opinion as to whether nitrite in bread, such nitrite as would be in bread made from flour bleached by nitrogen peroxide gas—would affect the digestibility of the bread?

A. My observation has been that it does.

455 Q. And how does it affect it, improve or impair the

digestibility? A. Impairs it.

Q. The degree of impairment, upon what does that depend? Has the quantity of nitrite any effect upon the degree of impairment?

A. Apparently it has. The greater the amount of nitrite peroxide used in the process of bleaching, the more the effects

of impairment seem to be apparent.

Q. What amount of nitrites found in water justifies the

condemnation of the water for use as drinking water?

A. Why, that amount varies with different localities. But when you find nitrites the one-thousandth of a part in a million, you would suspect that that water had been contaminated unless you know the source of it.

Q. That would be one part to the billion?

A. One part to the billion. The average of American waters is about three parts to the billion.

Q. Of nitrites? A. Of nitrites.

Q. Per billion. Now, as to the amount of nitrites required to appreciably or observably affect blood pressure, have you made any particular experiments yourself upon members of the human family or lower animals for the purpose of getting at the question of the amount required to appreciably affect

blood pressure in the blood vessels?

A. I have made experiments upon rabbits and dogs by the direct injection of varying amounts of nitrite into the circulation, myself, and the smallest amount that I used that gave me a positive lowering of the blood pressure was in the proportion, when the stuff was injected into the blood vessel of the dog, of about one part to two million, eight hundred thousand (2,800,000) parts of the body weight of the dog experimented upon.

Q. That is, comparing the weight of the nitrites with the weight of the dog, the amount just observed is one part of nitrite to 2.800,000 parts of dog. I have expressed that correct-

ly, have I, Dr. Jones?

456 A. You did. Now, in reference to the human being, the smallest dose I experimented with was on a young

man weighing 120 pounds and a half grain of the sodium nitrite caused a fall in his blood pressure—given by mouth—of 12 milligrams; that is, 12 millimeters of mercury, which is a little over half an inch of mercury.

Q. That relates to the instrument that you have for meas-

uring blood pressure?

A. For measuring blood pressure.

- Q. That is an appreciable amount, sufficient in range to establish its effect, is it?
  - A. Yes.
  - Q. One half a grain of sodium nitrite?

A. Half a grain of sodium nitrite.

Q. About half of an ordinary dose such as you administer in your practice when you administer sodium nitrite, is that correct? A. That is correct.

Q. This was a young man.

A. A young man 28 years of age, weighing 128 pounds; found from observations made always under the same conditions—observing blood pressure for several hours before the experiment began, and several hours afterward.

Q. Then your conclusion from all the observations, is what?

A. That the effect of the nitrites is in direct proportion to the dose administered, and that it has a tendency to upset digestion and lower the blood pressure.

Q. Now, it lowers blood pressure? A. Yes.

Q. What is the effect upon that? I mean, has it a depressing effect, or an elevating, exhilarating or stimulating

effect—the lowering of the pressure?

A. I find by observing a great number of persons that there is a normal blood pressure for health just as there is a normal pulse rate in a normal temperature, and conditions that either increase or lower that blood pressure are not conducive to the continuance of good health.

457 Q. Coming back again to your work in the examination of plant life in looking for the presence of nitrites, did you make any examination of clover, or any part of it?

A. Yes, I examined the root of clover and found the surface of the root—that nitrites gave a positive reaction. I cut open some little tubers which are supposed to be the nitrogen-storing portions of the plant, and which give the pea of the clover such valuable fertilizing properties,—I cut these nodules open just as I cut all the other roots free from the outside contaminating nitrite or reacting material, and found that nitrites were not preset in these nodules.

Q. To what do you attribute the positive reaction on the surface of the root?

A. To the action of nitrifying bacteria of the soil and its contents, that is, the organic contents of the soil.

Mr. Butler: I think that is all.

(Whereupon at 4:30 o'clock p. m., an adjournment was taken until ten o'clock a. m., June 7th, 1910.)

Kansas City, Missouri, Tuesday, June 7, 1910. 458

Pursuant to adjournment, court met at nine o'clock a. m., June 7, 1910, and proceeded with the trial of said cause as follows:

The Court: You may proceed with this case.

Mr. Butler: There is one question, Mr. Elliott, I would like to ask Dr. Jones.

Hamilton P. Jones, resuming the stand, was examined further, and testified as follows:

By Mr. Butler:

Q. Dr. Jones, have you made any calculation to determine the relation between the weight of the one-half grain of nitrite of sodium, and the weight of the young man, 128 pounds, to whom you administered it, with the result of changing, and lowering his blood pressure, to the extent that you have described, yesterday?

A. The weight was one part of sodium nitrite to 1,680,000

parts of body weight. Q. Of that man?

A. Of that man. Approximately.

Q. Yes? That is the relation, in weight, of the medicine, and the weight of that young man, would be as one is to 1,680,000. Am I right? A. Yes.

## Cross-Examination

By Mr. Elliott:

Dr. Jones, I will ask you if you ever made any analyses of the electrified air that comes from an Alsop machine.

A. I have not.

Then you are not prepared to state the constituent 459 of that medium?

Not from personal knowledge, derived from analyses? A.

And you would not know the extent of dilution of any peroxide of nitrogen that might be in it, with air, would you?

A. No. I should think that would depend upon the manner in which the machine was worked.

Q. Yes, but I say, you wouldn't know it?

No. That is right. A.

Now, have you made any examination, or analysis, of the particular flour that was seized in this case? A. No.

Q. And you don't know whether it contains nitrites, or nitrous acid, or any of these other substances, from your personal investigation? A. No.

Q. Or, the extent that it might contain any of these things?

A. No, sir.

Q. Or, you wouldn't know if it had been injured in any way?

A. I know nothing about the flour, from personal knowl-

edge.

Q. I want to ask you one or two questions about your familiarity with nitrites occurring in potable or drinking water. First, have you made quantitative analyses in this regard?

A. In what regard?

Q. The occurrence of nitrites in drinking water.

A. I have.

Q. Are you prepared to give us, in a general way, the ex-

tent to which nitrites occur in drinking water?

A. Nitrites may or may not occur in drinking water, and usually when they occur in amounts exceeding three parts—three thousandths parts to the million, we look upon that water with a great deal of doubt and suspicion.

Mr. Butler: I didn't get the figures, Mr. Elliott?

The Witness: Three thousandths.

By Mr. Butler:

460 Q. Of one part?

A. Yes. It depends, Mr. Elliott, upon the source of the water.

By Mr. Elliott:

Q. I was just going to ask you that. You stated yesterday that, where you found nitrites in water—see if I correctly state you—if you didn't know the source of the water, might lead you to condemn the water? A. That is true.

Q. Yes, sir. Now, suppose you did know the source of the water, and you found no contamination. Would the presence

of nitrites in that water lead you to condemn it?

A. No, because all nitrites in water have been rather an index of other sources of nature than those of the nitrites themselves.

Q. And that is the point I wanted to bring out. Isn't it true that, with water analyses, these nitrites are an index of

possible contamination? A. Yes, sir.

Q. Now, then, as a matter of fact, hasn't it occurred in your practice, that you have approved or passed as potable water—drinking water, which contained nitrites, where you found there was no contamination?

A. Where I could determine that the source producing the pitrites had been rendered inert, so far as the development of pathogenic germs was concerned, I have passed that kind of water, but, with the proviso or suggestion, always, that it be boiled, because you can't be certain in those regards.

Q. Now, with respect to your analysis of these vegetables. I think you testified that you have found vegetables giving a

nitrite reaction, in certain cases.

A. I did not testify that I had found vegetables giving nitrite reactions, except they were undergoing decomposition.

Q. I said in certain cases. They were vegetables you bought in the open market? A. Yes.

Q. Were they sold as food? A. They were sold as food.

Q. Were they fit for food?

A. Not when they contained nitrites.

461 Q. Well, aside from that. They were not decomposed to such an extent that they would not be fit for food?

A. Well, they would have passed muster, after the portions decomposing had been pared off, and the vegetables properly cleaned and fitted for cooking—that is, in the ordinary sense of the cook looking at the vegetables.

Q. Well, what I am trying to get at—were these vegetables that you bought the ordinary vegetables you would buy in open

markets. A. They were bought in open markets.

Q. And I think you have testified they were fit for food? They were not decomposed so they were not fit for food? Now, I think you have stated that you found, in some of these cases, that the exterior of some of these vegetables gave reactions for nitrites—some of them, I mean. A. That is true.

Q. Some others, you got no reaction, I believe. A. No.

Q. Now, I don't recall, but I will ask you—did you, in any case get a reaction from nitrites from the interior of any of these vegetables?

A. Only in the case of a decomposing egg plant.

Q. A decomposing egg plant? A. Egg plant.

Q. That was the only case?

A. That was the only case, from the interior.

Q. Now, did you examine more than one specimen of each of these vegetables you have referred to? A. I did.

Q. Tell us how many-one, two, three, or-

A. (Interrupting) Well, the way in which I purchased these vegetables was this: I simply went to the market and bought fifteen cents of each variety, and each of the articles that I purchased—there were some ten or fifteen potatoes, for instance,—of each kind.

Q. Well, a number in each case?

A. Yes, a number, more than one, and I suppose it would average probably five or six, for each variety of vegetable.

Q. You examined all of each class, for nitrites?

A. Yes.

462 Q. With the results you have testified?

A. As I have testified.

Q. Now is it not within your knowledge that other investigators have reported the presence of nitrites in some of these vegetables, where you didn't find the nitrites?

A. Well, as I explained to the jury, yesterday, there is a

difference in the care exercised-

Q. (Interrupting) Yes, you can explain that later. My question is, is it within your knowledge that other investigators have reported the presence of nitrites in some of these instances where you failed to find them?

A. Well, I don't know that of personal knowledge.

O. Well, it is not within your knowledge?

A. No. It may be so. In that event, I should say that the vegetables experimented upon were decomposed, if they got it from the interior.

Q. Now, these nitrites are easily soluble in water, are they not? A. Yes.

Q. And, take, celery and beets, and kindred vegetables. They are composed very largely of water, are they not?

A. Well, beets more so than celery. I do not remember the exact proportions.

Q. Well, I don't.

A. But a considerable volume of water.

Q. And wouldn't it be reasonable, don't you think, if nitrites were there, that they would get into the inside of the vegetables, so much water being in there?

A. No, that doesn't follow.

Q. You don't think that would be a reasonable thing to occur?

A. Not unless they had invaled by bacteria.

O. Well, let us assume that, then. Wouldn't you have them on the interior?

A. Yes, If the vegetables were undergoing decomposition, of course, Mr. Elliott, I will have to say this, that, if a bad vegetable is soaked in a strong solution of the nitrites, it is probable that, through the processes of osmosis, that eventually you might find nitrites in that vegetable, but that nitrite would be added to the vegetable, and would not be a natural constituent of it.

463 Q. I think that is very probably true. I am not asking you about soaking it in nitrites. Now, I will put this to you. Are you prepared to state that a perfectly fresh, green vegetable, undecomposed, if there is such a thing—just as fresh as you can buy it—in these vegetables that you have named, are

you prepared to state that they may not contain nitrites on the interior?

A. Prepared to state that they would not contain them.

Q. As a basis of your investigation? A. Yes.

- Q. But, my question is, are you prepared to state that they may not contain them?
  - A. If they are healthy and sound, they will not contain them?
- Q. That scarcely answers it. May they contain it? That is the point.
  - A. If they are decomposed, they may. Q. No, I say, if they are perfectly fresh.

A. They will not.

Q. Well, would you just mind answering that, the way I put that to you? Are you prepared to state that they may not contain them?

A. You mean "may" in the sense that they cannot?

Q. May these fresh vegetables contain nitrites, on the interior?

A. They may not,

Q. And you mean by that, in no case can they contain them?

A. If they are sound? Q. Yes. A. Fresh?

Q. Yes. A. Normal vegetables?

Q. Yes. A. They will not contain them.

Q. Now, I want to ask you about the soil down in Louisiana. How would that compare, if you know, with the soil in this locality?

A. The soil in Louisiana is very much more fertile than it is in this section, except, perhaps, in some of the bottoms, and the valleys around in this state.

Q. Well, is it a more sandy soil than what we have up here?

A. Well, most of Louisiana—the rich agricultural lands are alluvial deposits, largely what we call river sand.

464 It is a mixture of—they agree that it has been washed

down from the great West—and Northwest, drained by the Mississippi.

Q. But the soil is a sandy soil, as compared with the soils of Kansas and Nebraska?

A. No. It varys very much, in localities, in some of them, buckshot clay, and sandy soil, depending. Why it should be clay in some places, and sandy in others, I am not prepared to say, but the soil is unusually rich.

Q. Now, I want to ask you if you will tell us, just briefly, this process by which plants derive nourishment from the soil, and simply as applied to the formation of nitrates and nitrites?

A. Well, in order that you might understand my conception of it,—you realize that man eats meat, cattle, and things of that kind, and he also eats vegetables. However, the cattle

derive their nourishment from vegetables. One of the tissues of vegetable nutrition is a series of salts, known as nitrates. Now, the product of decay of animal and vegetable matter, and the product of decay of the urinary and fecal discharges of man are decomposed by a series of bacteria called saprophytes in the presence of oxygen, usually, and sometimes it may happen without oxygen being present. These saprophytes decompose this organic matter into carbon dioxide, ammonia, nitrites, finally into nitrates, so that you have the complete cycle, on the upper part of the world—might say, the things that we see—the grass, and the cattle, and the human beings; on the other side these organic or inorganic substances, going under the under cycle, go back to nitrates, the food which is necessary for the vegetable to build up the albuminous parts, which we all require for food.

Q. Well, what I mean is, how do the plants get these nitrites? How do they get them? What is the process?

A. Well, that process is largely assisted by bacteria. As a matter of fact, the stomach and the intestines of an animal is really outside of his body. You have an opening here, and other openings, but it is a straight through-and-through pipe.

So that, for all practical purposes, you may state—I may accept as true, that a man's stomach and intestinal

tract is really outside of his body.

Q. Doctor, I don't want to interrupt you-

A. (interrupting) Wait just one moment. I am getting to my point.

Q. Just explain it, won't you?

465

- A. The root of a plant is covered with a membrane, and it secretes juices, which act very much as the digestive juices within your stomach, do, upon the soil, and the products produced in that soil, by fertilization, and the action upon fertilizer and other constituents of the soil, brought about by bacteria.
- Q. Well, what happens, then? What is the action on those nitrites?
- A. The nitrites are taken up, as nitrites, into the plant, and built up into the amido compounds. They are necessary in the building up of the proteins of the body.

Q. Well, you say these bacteria, and these ferments you have referred to, do not act to reduce these nitrates to nitrites?

A. They may, in certain instances, reduce them to nitrites. I don't know that the roots do, but the bacteria may.

Q. Well, do I understand you to say the plants do not feed on nitrites? A. They do not feed on nitrites.

Q. They do not [deed] on nitrites?

A. Nitrites are poisonous for animals and vegetable plants.

Q. All right. They feed on nitrates? A. Nitrates.

Q. And all vegetables, to a greater or less extent, contain these nitrates? Is that the fact?

A. Yes, sir, with some modification of it. It may not always remain that way.

Q. Now, you testified that you found some nitrites in a ham, I believe? A. Yes, sir.

Q. What was that—a smoked ham, or what kind of a ham it was? A. It was a hog ham.

Q. I mean, was it a cured ham? A. Yes, a cured ham.

Q. Did you make a quantitative examination for nitrites?

466 Q. You do not know how much was there, but you just found the nitrites were there? A. Present.

Q. Now, as to the human saliva. Have you determined, in those eighty or more tests you referred to, where you found the nitrites in all cases, did you make any tests, there, for the amount? A. Yes, I made several determinations.

Q. Now, give us the range-maximum and minimum.

A. In the same individual?

Q. No, throughout your whole experiments. What was the greatest amount you found, and what was the smallest amount, so we can get the range?

A. I tested the saliva of a man who had "made a night of

it."

Q. Had what?

A. Had "made a night of it." A night of it. Q. Made a night— A. (interrupting) Of it.

Q. Oh, yes. I don't know what that is.

The Court: Been on a "tear."

Mr. Elliott: Yes. I don't know anything about that, Your Honor.

A. (continuing) He gave the highest range of nitrites that I found. That was eleven parts to the million, in the morning when I first saw him. I kept that man under observation for several—fourteen hours, testing his saliva from time to time and, after he had brushed his teeth, and gotten straightened up, his nitrite content fell down to something like one-tenth of a part per million, so that his average for the twenty-four hours, I took it as roughly being about a quarter to two-thirds—that is, a three-eights of a part, per million, for the total amount of saliva excreted by him, or secreted by him, during the day, which I judged to be about three pints.

By Mr. Butler:

Q. That is, for twenty-four hours' observation?

A. Yes. About fourteen hours' observation,

467 By Mr. Elliott:

Q. Now, take the highest in normal cases. Some person, who hasn't been out on a tear—average individual. What was the highest amount you found?

A. The average single tests that I made would be about one-

quarter of a part per million.

Q. One-fourth of a part per million?

A. Per million. And many of them gave the merest trace, so much so that you must just call it a trace. Just simply gave a little trace.

Q. All contained some, however? A. Some.

Q. Now, you have stated that these nitrites in the mouth are formed by decomposition products in the mouth, I believe. A. Yes.

Q. Well, isn't that just another way of saying there are

bacteria in the mouth?

A. Well, there are products of bacterial action. Naturally you wouldn't have them, without bacteria, unless you had eaten them, or got them in flour or bleached flour.

Q. I say, bacteria are always in the mouth? A. Always.

Q. Now, you testified some of these juices that form saliva, which you referred to coming out of these glands, into the mouth, and you said in those, in seven cases, you didn't find any nitrites? A. That is true.

Q. Now, did you test that for nitrates-nitrates?

A. I did not.

Q. And if there had been any nitrates in those juices coming into the mouth, the bacteria in the mouth would have reduced them to nitrites, would they not?

A. Yes, but I don't think that is the way the nitrites in

the mouth are formed.

Q. That doesn't answer it.

Mr. Butler: I didn't hear the answer.

Mr. Elliott: The answer was that nitrites were not formed in the mouth in that way.

468 Q. But my question was, if the nitrite was in the bacteria in the mouth they would reduce the nitrates to nitrites, and I understood you to say they did.

A. If they are present.

Q. Yes.

A. I didn't test for that. I don't know that they are present

in the body.

Q. Now, isn't it a fact that no matter how these nitrites in the saliva are formed, the fact is they are there, and we are constantly swallowing them, and cannot avoid swallowing them. Isn't that true? A. That is true.

Q. Is fecal matter, or the feces you referred to-is that decomposed organic matter?

A. [Way], it is changing, and in a measure decomposed, but

not by the particular variety that produce nitrites.

Q. You would have expected to find nitrites in them, wouldn't you? A. No, sir.

Q. If they are the products of decomposition?

Don't have nitrites, formed except in the presence-by bacteria in the presence of oxygen.

Q. Well, there are bacteria in the intestinal tract, are there

not?

Yes, sir, lots of them. A.

- And you say you wouldn't expect to find bacteria in the feces-I mean nitrites?
  - No, sir, not till it decomposed, outside. A. And you didn't find them? A. No, sir. Q.
  - Now, you didn't find them in the urine, I understand. Q.

A. No. sir.

How many analyses did you make in that regard?

May I refer to my record? A. Yes. A. I think twenty. Q

Was that on different individuals?

Different individuals. I may say that, on the ten cases of feces that I examined, I also examined the urine, of those individuals. The others, where they overlapped, why,

of course, the same individuals were not used. 469

Q. That is, in ten cases you examined the feces and the urine for nitrites, and there were ten other cases where you examined the urine only? Is that correct?

A. That is, in the ten other cases, I may say that in all these cases I examined the saliva, and found nitrites present

in the saliva, of course.

Q. Now, is it within your knowledge that other investigators state that nitrites are in the urine, that they have found them there?

A. I have read that they found nitrites in the urine, after

its administration.

Q. No. I didn't ask about any administration, Doctor. I meant normal.

A. Normal? No, sir, I have never heard that statement.

Q. You have never heard that?

A. No, sir, I wouldn't believe it if I did.

Q. Sir?

A. I say, I would not believe it if I did hear it.

Well, without the administration of nitrites, do you know any authority who has simply made an examination of the urine, and stated he has found nitrites in it?

A. No. sir.

Q. Never saw such a statement? A. No, sir.

Q. What becomes of these nitrites that are swallowed in the saliva, if they are not passed out through either of these sources?

A. They are probably oxidized to nitrate.

Q. Now, I want you to tell me what experience you had with testing for nitrites, or testing the effect of nitrites in a human being, other than the injection of this half grain you referred to yesterday.

A. That half grain was not injected. It was administered

by mouth.

Q. Oh, I beg your pardon. I thought you said-where you got the blood pressure.

On the young man?

Yes. A. It was taken by the mouth. Q.

Well, I have got my notes mixed. Well, aside from that, what other tests have you made, with nitrites, to get

the effect on the human economy? 470

A. I have administered, in the course of my practice, nitrites in various forms, and in varying doses, to accomplish a certain, definite purpose, which was to reduce the blood pressure, when I thought that the blood pressure was endangering the life of the man, being high-too high.

Q. Is that what you testified to yesterday, when you said you had given a grain of nitrite, three or four times a day,

for a period from eight days to two weeks? A. Yes.

Q. Now, aside from the administration of it as medicine, for the purpose you have indicated, and the administration of this half grain to a young man, what else have you done?

A. You mean in a pharmacologic study? To note the effect upon the human economy.

A. Well, I was assistant to the professor of chemistry in the Medical Department of Tulane University, which used to be part of my duty, to submit animals and persons to the influences of various gases.

Q. Human beings, I said. Human beings.

A. Well, now, just in the ordinary practice of my profession, I have administered uitrite, and I have made it my duty to go into the pharmacology laboratory of the Tulane University, and study its effect upon animals and to study its effect upon human beings, by means of the sphygmograph. In my own practice, how many times I have administered it. I don't know.

Q. But your experience has been, as I understand it, the giving of sodium nitrite or nitrite in some form, for a certain effect, medicinally, and then you have administered this half

grain to this young man?

A. Yes. I would like to say in explanation, that it has been my custom, for a number of years, to study the blood pressure of my patients, and it is one of the routine duties of my trained nurses, to take the blood pressure in these various diseases, just as they would the temperature, every three or four hours, and record it, so that the express experiment recorded here is simply to indicate the effect of the nitrite upon a normal individual.

Q. Now, have you ever dealt with unweighable amounts of nitrites, to observe any effect from their use?

571 A. No.

Q. You think it possible that a person could observ any effect from the use of an unweighable amount of a nitrite?

A. Why, let me get that question? What do you mean by

an unweighable amount? How much is that?

Q. So small that you can't weigh it. I don't know.

A. It would be an amount, wouldn't it—an unweighable amount would be an amount?

Q. Well, I will let you answer that.

Mr. Butler: Well, I think, if the Court please, he should state some definite amount.

Mr. Scarritt: If he doesn't know what an unweighable amount is, he might say so.

Mr. Butler: He has asked Mr. Elliott what he intended by the question. I am sure Mr. Elliott would not intend to conceal any weapons in his question.

A. I will answer it. There is no unweighable amount.

## By Mr. Elliott:

Q. There is no such thing? A. No.

Q. You think there are any scales, sufficiently delicate to measure an amount of nitrites in the proportion of 1.8 per million, as they might be contained, we will say, in a loaf of bread? A. Well, I don't know about the delicacy of scales, to that extent.

Q. Well you are familiar with apparatus that you use in

laboratories, and so on, are you not?

A. Yes. I have no such scale in my laboratory.
 Q. Well, do you know of any such scale? A. No.

Q. In your judgment would it be possible to weigh such an

amount. A. My experience has been-

Q. (Interrupting) Now, will you just kindly answer that question. In your judgment would it be possible to weigh such an amount?

A. I think it would be possible, with the properly per-

472 fected machinery.

Q. Well, if there is no such machinery, of course, theoretically, we can say it could be made, but if there is none, with our present advance in science,—on that basis, I say, would it be possible to weigh the amount that would be present in a loaf of bread? A. Yes.

Q. You think it would be possible? A. Yes.

Q. Well I think we ought to know how.

A. Well, give me a basis for computation of the nitrite in the bread—the loaf of bread—and I will give you the weight of that amount, and you will see that it will be a ponderable

amount, can be weighed on an ordinary scale.

Q. Well, I think we are in accord, Doctor. I think we simply misunderstood each other. I meau, with such instruments as are known to science, is it possible to weigh an amount of those nitrite reacting materials which might be present in a loaf of bread, made from a flour containing 1.8 parts per million? A. Unquestionably.

Q. You say unquestionably it is?

A. You can weigh it, if you can get it toget'ser in the form in which you expressed it, then you can weigh it.

Q. If you can get it together? A. Yes.

Q. Well, now, then, of course, it leads to that questionnaturally, can you get it together?

A. No, I don't think you can.

Q. Then, that means you can't weigh it, doesn't it?

A. You reason by analogy, and you use methods that have been established by long practice, to accomplish these things.

Q. No, I am not reasoning at all. I am simply taking your answers. You say you can weigh it, if you can get it together, but you say you can't get it together. Therefore, it means that you can't weigh it?

. No, it does not follow that you can't weigh it. If you

could get it together you can weigh it.

473 Q. Well, on what scale, and on what instrument, would you say you could weigh the amount of nitrites that would be present in a loaf of bread made from this flour—made from the flour in this seizure, containing 1.8 parts per million of these nitrites?

A. You could weigh it on ordinary laboratory scales.

Q. Do you know the least amount the finest scale weighs—laboratory scale? A. No.

Q. I believe that is known. If you don't know it, we can

get it.

A. I have a scale that weighs one ten-thousandth of a gramme.

Q. One ten-thousandth of a gramme?

A. That would be approximately about one fifteen-hundredth of a grain, roughly calculated.

Q. One fifteen-hundredth of a grain?

- A. I don't say that is correct, but there are fifteen grains to the—
- Q. (interrupting) Now, you personally, never observed the effect of nitrite in less, as I understand it, than a half grain dose.
- A. I have given less than that, and observed its effect. On this young man, that was the minimum amount that I got—
- Q. (interrupting) Yes, but I say, you haven't observed the effect on a human being of the administration of less than a half grain dose? A. I have.

Q. You say you have? A. Yes, sir, I have.

Q. Well, what were these effects? You mean where you have given it to reduce blood pressure, as you have testified?

A. Yes.

Q. And have given it in less than half-grain doses?

A. Yes.

Q. What was the smallest dose you ever gave it in?

- A. The smallest dose I ever gave it in was, a quarter of a grain.
- Q. Now, have you ever observed the administration and the effect of less than one-quarter of a grain? A. No.
  - Q. Then, your statement which you made yesterday, as to what effect the administration of these minute amounts nitrites was simply based on your knowledge of the ac-

474 nitrites was, simply based on your knowledge of the action of a larger amount, was it not?

A. On varying doses, of amounts larger than a quarter of a grain, and I noticed—

Q. (interrupting)) Well, from a quarter of a grain up.

A. From a quarter of a grain up?

Q. Yes.

A. I noticed a gradual increased effect, as the dose was increased, and correspondingly, a diminished effect as the dose was diminished.

Q. Yes, down to a quarter of a grain? Beyond that, you don't know anything? A. No, sir.

Q. From a practical observation? A. No, sir.

Q. Now, as you haven't examined or analyzed the gas of this Alsop machine, it isn't within your personal knowledge that that gas is in sufficient concentration to make any definite alliance or combination with anything in the flour, is it?

A. Let me have that question?

Q. Read it.

(Question read by the reporter)

A. It isn't within my personal knowledge, to know anything about the gas produced by the Alsop machine, as being analyzed directly from the machine by me.

Q. You have acted on the assumption that these things are

here, and as it has been told you, I suppose.

A. It is set out in the patent, that it is a bleaching material, NO2. NO2 will act on materials in the flour, just in proportion to its amount.

Q. But, that is theory, isn't it? A. No.

- Q. What have you done to entitle you to say that?
- A. I haven't done very much, personally. Not enough to entitle me to say that.

Q. Well, that is what I want.

- A. I have made a few analyses, which lead me to that conclusion.
- Q. For instance, did you take some of this air, as it is treated by the electric arc, in the Alsop machine, and as it passes into contact with the flour, and you found it makes that flour white, and then you took some of that concentrated peroxide of nitrogen that was in that jar, there, the other day, and give enough of it to the flour to turn it yellow, or whatever color it may be turned to—dark color, that shows your theory isn't true, doesn't it?

A. What theory?

Q. That the effect is in proportion to the amount.

A. Why, of course, it shows it is true.

Q. In one case, you whiten the flour, and in the other case, you darken the flour, don't you? A. Yes, but you—

Q. (interrupting) That was only an illustration.

A. That doesn't disprove my theory, at all.

Q. You say it doesn't?

A. You have a law that is known as the conservation of

energy. You can't destroy anything.

Q. But this is theory? You have stated that you don't know the fact that you have testified to. It is just your theory, that that is so? In other words, I think you said in your testimony it was reasonable to suppose these results?

A. You are compelled to accept that. A thing having an effect in one degree, in less degree will have a correspondingly less effect. That is a law which we cannot avoid. It is not a

matter of theory. It is a fact.

Q. Well, isn't it within your knowledge, in the art of chemistry, that certain things, in certain concentrations, will not produce any effect, at all, and you get them in greater concentrations, and they will produce effects?

A. That is occasionally true.

- Q. That is perfectly true, isn't it.
- A. When combined with other things.

Q. Let me give you an illustration. Take dilute nitric acid, and add it to benzine. Do you know if that will produce

any compound, at all? A. No, I do not.

476 Q. Well, I am told it won't produce any compound, and you take a higher concentration of nitric acid, and it will produce a certain compound, and you take a still higher concentration, and it will produce still another compound. Those things are well known in chemistry, at any rate, whether you know that specific illustration or not, is it not?

A. In chemistry we have—I suppose he is trying to drag

out the law of mass actions. Is that it?

Q. Maybe so. You can bring it out.

A. It is a fact that if we have, for instance, some hydrochloric acid, which is a very strong acid, and some acetic acid, in the presence of some sodium, that, in certain strengths, weak acetic acid will not affect the sodium chloride solution, but if you continue to add more acetic acid, eventually you will have some sodium acetate, or some sodium chlorite formed, but that is a thing that is dependent upon the electrical charge of each of the component parts composing the thing.

Q. Yes? Now, suppose a fellow had started at the other end of that, where he got the reaction, and he had reasoned that, diluting that thing down to any amount, he would get the same reaction, he would have been wrong, wouldn't he?

A. He would not have been wrong, in the case of nitrogen

peroxide.

Q. No,—your illustration. That illustration you just gave. He started out with the concentrated, and reasoned that he would go down to the lowest concentration, and would still get that reaction, he would have been wrong, wouldn't he?

A. It is a law that no one can gainsay, in chemistry, that you must know what you are going to produce, before you

can write your formula.

Q. Yes, sir. Now, then, answer my question.

A. So, when you speculate that way, you are at sea. You

don't know what you are going to get.

477 Q. All right. I quite agree with you. Now, take your illustration, there. A man that had started with the higher concentration, and reasoning by analogy, he would say that, down to a lower concentration he would have the same result, but in less degree, he would have been wrong, wouldn't he?

A. I would not know, unless I knew what I was going to get.

Q. But you have just stated, in the lower concentration you did not get the reaction, did you?

A. When he got in his lower concentration, he would get his hydrochloric compound.

Q. But you don't get the reaction you get with the higher concentration, do you?

A. Just make yourself clear. I don't understand.

Q. Well, you know the illustration you gave? A. Yes.

Q. To illustrate the law of mass action?

Yes. You start with a higher concentration of hydochloric acid. You would work down the other way, I presume.

Q. Yes.

You want to reverse the process, and perhaps it would A. have a little bit of acetic acid, and a lot of hydrochloric acid, is that it?

Q. Yes. Now, will you get the same? A. No.

Then, you would not? In other words, in chemistry, you can't reason, always, by analogy, can you?

A. No, but you can go by experience.

- Q. But you haven't had any experience with these nitrites, in less than the amount you have named—that is, a quarter of a grain,-have you?
  - A. Yes. On a human being, you mean? Q. Yes, sir.

A. No, not on a human being, but I have on an animal.

Q. All right. You may give that afterwards. I am just asking you about a human being. Now, let us take this illustration. I think he had it yesterday. It is well known that the administration of a certain amount of nicotine will pro-

duce death, isn't it-into the human being. I mean?

A. Given in the right way, yes. 478

Q. Yes. And do you say that the person smoking a cigar is killing himself? A. My idea about nicotine-

Mr. Scarritt (interrupting): Just answer the question.

Mr. Elliott: Just answer the question.

Mr. Scarritt: Just answer that.

Mr. Butler: Well, just wait a minute. I don't think, in an examination of this kind, that counsel have the right to select the form of the answer.

The Court: No.

Mr. Butler: I think the witness, especially upon scientific matters, ought to be-

The Court (interrupting): Oh, it involves another thing, whether he is killing himself instanter, or by degrees, and all that sort of thing. So on, though. Let us get along.

The Witness: Shall I answer the question, Judge?

The Court: Yes.

A. (Continuing) When a man smokes a cigar, he gets presumable a certain amount of nicotine, which he must take care of. That requires energy. That means that so much has been necessary to produce the energy, and he hurts himself, just in so far as he has supply something to overcome the effect of the nicotine taken.

By Mr. Elliott:

Q. Well, that applies to nearly all the processes, does it not? A. It applies to peroxide of nitrogen.

Q. And it applies to eating and drinking, does it not.

A. Eating and drinking are different things from smoking. Q. Yes, sir. But the question is, if a certain amount of nitrites will poison a man, you think the amount of nitrites a man would get from smoking a cigar will poison him, to

any extent?

A. To the extent of the amount of nitrites produced by that cigar, absorbed by him, and combined with his blood.

Q. This produces, you say, the same poisonous action that the larger amounts produce?

A. In relative proportion.

Q. In relative proportion?

- A. The same amount. What I mean, Mr. Elliott,—we are speaking in large numbers. A dollar is a dollar, whether it is one of Mr. Rockefeller's billion, or whether it is my one or two, and a molecule of nitrogen peroxide, has its same intrinsic capacity for work, no matter whether it is in large amounts, or a small amount.
  - Q. I don't think I asked you any such question, Doctor.
    A. No. I wanted you to understand how I felt about it.

Q. Now, as a matter of fact, that isn't correct, is it? Can you say that a molecule of nitrogen peroxide can have the same effect as a ponderable amount, in any reaction?

A. A molecule of nitrogen peroxide is capable of doing a certain, definite amount of cliemical work. Two chemicals would do twice that much, three would do three times that

much, and so on.

Q. Then, the law of mass action, and those things, are rather thrown aside, in that statement, are they not?

A. Well, you do not have the mass action. You have, there, a direct chemical combination. Mass action is a thing that does not happen in this instance.

Q. All right. Now, I understood you to say this flour contains nitrites. Now, on what basis did you make that statement? A. Which flour, Mr. Elliott?

Q. Flour bleached by the Alsop process?

A. The Alsop process?

Q. Or did you say that? Perhaps I am wrong.

- A. No, I don't say that. Why, I have no personal knowledge that it does contain nitrites, but it has been testified that it did, contain certain amounts.
- Q. All right. I just wanted to bring out your statement in respect to nitrites contained in flour, bleached with nitrogen peroxide, and you say all you know about that is what has been told you?

A. In this particular flour.

Q. In other words, you haven't recovered any nitrites, as such, or nitrates, as such, or nitrous acid, as such, or nitric acid, as such, or peroxide of nitrogen, as such, from any flour?

A. No, but I-

Q. (interrupting) That is enough.

- A. (continuing)—examined, in my laboratory, flours not bleached by myself, but said to be bleached in varying degrees of strength. The higher the grade of flour, the greater number—
- Q. (interrupting) But, Doctor, I don't think you ought to put that on me. You have answered my question. I said, you have never found these things in flour?

A. I have found nitric acid, as a result, according to the

amount of bleaching,-

Q. (interrupting) I didn't ask you anything about that,

A. Yes, you did ask me about nitric acid.

Q. Well, is your answer wrong? You said you had not.

A. I have found nitric acid in it.

Q. Now, read that question and answer.

(Question read as follows: Question. In other words, you haven't recovered any nitrites, as such, or nitrates, as such, or nitrous acid, as such, or nitric acid, as such, or peroxide of nitrogen, as such, from any flour?)

A. That is true.

Q. Now, you testified as to some experiments with bread, or some investigations, relative to bread, I believe.

A. Yes, sir.

- Q. And I will ask you where the flour was obtained from which that bread was made.
  - A. The flour was obtained in the market, at New Orleans.

Q. How was it bleached?

A. I don't know how much it was bleached.
 Q. Did you bleach it? A. I didn't bleach it.

Q. Who brought it to you, or-

- A. (interrupting) I bought it, as a bleached flour, from a commercial—
- 481 Q. (interrupting) Oh, you bought it, as already bleached?
- A. Already bleached, Commercially bleached flour. I don't know how it was bleached,

- Q. Now, how many experiments did you make from that bread?
- A. I had a loaf made, the ordinary baker's way, and I had biscuits made, with yeast.

Q. You mean, just one loaf, and these biscuits?

A. Yes, sir.

Q. That is all? A. That is all.

Q. Now, how much of this nitrite reacting material did you find in the flour? A. 2.7 per million.

Q. 2.7? Now, did you estimate the amount in the bread,

after it was baked? A. I did not.

Q. You did not? You don't know whether the bread contained any or not?

A. I tested it for nitrite reacting material, and found that.

Q. But you didn't test it quantitatively?

- A. Not quantitatively, but it seemed to be less, in looking at the reaction.
- Q. Now, what did you do with that bread? What tests did you make with it?

A. I bought from this firm two kinds of flour-

Q. (interrupting) No, no. You have already got the bread.

A. Yes, but you asked me what tests I made.

Q. Go ahead.

A. One was a flour sold as a bleached flour, and, on testing, gave nitrite reaction. The other was sold as an unbleached flour, flour manufactured in New Orleans,—not from the same kind of wheat, but, in this case, a Durum flour—but unbleached. It was tested for nitrites, and they were not found, and bread and biscuits were made from the two samples of flour, under equal conditions, and then tested, and the nitrite reacting flour, gave nitrite reactions in the bread, and in the biscuits, whereas, neither the bread nor the biscuits, in the unbleached flour gave the reaction, both being baked in the same kind of an oven, which was a gas open, with an open gas flame.

Q. Now, may I ask you, was the bread from the bleached

flour made from a soft, winter wheat flour?

482 A. I have no idea what the quality of the wheat was. Q. At any rate, it was not a Durum flour?

A. I don't think it was a Durum, at least it came from somewhere out here in this section of the country, and the other flour was made in New Orleans.

Q. You made your comparative digestion experiments, between the bread made from the bleached flour, in one instance, and the bread made from this unbleached Durum flour, in the other. Is that it?

A. I supervised the work of Dr. Mann, who has the necessary data pertaining to that flour. I don't remember what flours he used

Q. Well, I thought you were just giving us the details of it.

A. No, this is a different experiment. You spoke about making and then you are coming to digestion experiments now.

Q. What did you do? Just make the baking?

A. The baking, and the tests for the nitrites, in the original flour, and the bread.

Q. Well, you haven't given any testimony about the baking results, have you? I don't recall such.

Mr. Butler: Yes, he said it was in the bread, indirectly, and, then, as respects the digestion tests, he collaborated with Dr. Mann, and hasn't the details. You excluded that on me. I withdrew the question.

## Mr. Elliott: All right.

Q. But it is in your knowledge, that this flour that was used by Dr. Mann in his digestion tests was, in one case, made from flour, not Durum, and the other was?

A. This bread was not put in any digestion tests at all.

This was a distinct experiment.

Q. Was anything done with that bread, except bake it, and test it? A. Bake it and test it.

O. For nitrites? A. Yes.

Q. Well, I beg your pardon. I got the wrong idea. You don't know what bread, if any, Dr. Mann used? A. No.

Q. Now, you have testified, I believe, as to the poisonous effects of peroxide of nitrogen gas, have you not?

A. Yes.

483 Q. I want to ask you if the fact that nitrogen peroxide gas is poisonous, has any relation, whatever, to the character of this nitrite reacting material that may be in the flour. A. Yes.

Q. You think it has? A. I think it has.

Q. Does it necessarily follow,—I mean, that, because nitrogen peroxide gas is poisonous, that some product made from it is poisonous? A. No, it doesn't necessarily follow.

Q. Does not necessarily follow?

A. That all products are necessarily poisonous. Some of them may be, and some may not be.

Q. For instance, carbonic acid gas is a poisonous gas, isn't

it? A. Yes.

Q. And yet, the carbonates, and bicarbonates are not poisonous, are they? A. No.

Q. And chlorine and hydrochloric acid gas are poisonous, are they not when inhaled? A. Yes.

Q. And yet the chlorides, and common salt are not poisons,

are they? A. Not ordinarily so.

Q. So, you understand my question? It doesn't follow that, because nitrogen peroxide is poisonous, that anything in the flour, as a result of the treatment by that is poisonous?

A. It doesn't necessarily follow.

Q. Now, this young man, to whom you administered this

half grain of nitrite. Was that sodium nitrite?

A. Sodium nitrite. That would be one part of nitrogen, as calculated—nitrogen of the nitrite reacting material, one part, to a little over eight million parts of his body weight, as calculated by Dr. Winton.

Q. And I understood it was one part.

By Mr. Butler:

Q. That is, if it is calculated as nitrogen, it will be one part to over eight million?

A. Yes. As nitrite of sodium, one to 1,680,000.

484 By Mr. Elliott:

Q. It would not be in that proportion, though, in proportion to his blood content?—How much blood is contained in an ordinary human being, of one hundred fifty pounds, say?

A. I don't remember exactly. I think about twelve or thir-

teen pounds.

Q. It would not be in the proportion of 1,680,000, to the blood, would it?

A. No, but the more you confine the action to the nitrites, the worse it is.

Q. Now, tell me what you did to determine this pressure test. Just tell us, in simple language, how you proceeded.

A. On the human being?

Q. Yes, this case.

A. We have a method of taking the blood pressure. We put a rubber bag of sufficient width, around the arm and that has a strap to go about it. From this bag is a tube leading to a column of mercury. Now, you put your hand on the man's pulse, and then you pump air into this bag, until you lose the pulse. Now, it is reasonable to suppose that the pressure that is sufficient to cut off the blood flow from the arteries, to stop the pulse beat, is equal to the pressure exerted by the heart behind it, so that the pressure in the bag balances the pressure produced by the heart, and you make your reading.

Q. And you have a scale up there, I suppose.

A. Have a scale.

Q. Yes, sir. Now, then, go ahead and tell us what you did. You gave him a half grain of nitrite?

A. This young man was observed by me for about five hours, before administrating this stuff, and his normal blood pressure

was one hundred twenty milimetres of mercury. Now, about four inches and a half mercury pressure was the work being done by his heart. His blood pressure stayed at, roughly speaking, four inches and a half, for five hours, before I made the experiment. Then, I gave him the half grain of nitrite of sodium, and took blood pressure readings every five minutes

after that. In about five minutes his blood pressure began to fall within about three minutes; five minutes, it gone down a good deal, and, in about eight minutes, it had reached the lowest, going down to practically four inches and then, after that, for the next eighty or ninety minutes, the blood pressure gradually went up, until about at the end of an hour and three-quarters after this half grain dose, it had returned to the normal. The half-grain dose giving him a fall in blood pressure equivalent to about ten per cent of his total

heart power.

Q. And how long was it before it returned to normal?

A. About an hour and forty-five minutes.

Q. An hour and forty-five minutes from the administration of a one-fourth grain? A. A half grain.

Q. A half-grain dose of nitrite? Now, had that young man

eaten anything, in those five hours?

A. That young man had had his breakfast at seven o'clock. The conditions were exactly the same, on the day that he got the grain, and the half-grain doses.

Q. Yes? I asked if he had eaten anything.

- A. He had had his breakfast.
  Q. Within the five hours, Doctor?
  A. No, not within the five hours.
- Q. Now, have you ever observed the difference in blood pressure before and after eating? A. Yes.

Q. Does it vary?A. Yes, it varies.

Q. Have you ever observed the effect of increasing or decreasing the blood pressure, from smoking?

A. Yes, but this young man was an inveterate smoker, and smoked all the time. I didn't know anything about that.

- Q. All right. I am not speaking about that. Did you ever observe an increase or decrease in blood pressure from smoking?
  - A. Yes, smoking increases it.

Q. And how about coffee.

A. Coffee increases it.

O. And how about whisky?

Q. And how about whisky?
 A. Whisky increases it for a while. Afterwards, depresses

486 Q. But a man after eating an ordinary meal, will have his blood pressure increased? A. Increases it.

Q. Did you tell this young man of any possible harmful effects from this administration of this half grain of nitrite?

A. Yes.

Q. What effect do you think that had on his mentality?

A. I had the machine on his arm when I told him that this might hurt him. It did not effect his blood pressure, at all.

Q. Well, mentality and blood pressure aren't the same thing. What effect do you think the statement that you were going to do harm to a person, would have on their mentality?

A. Well, it would depend very largely upon whether they were afraid of me, or were going to kill me for doing harm to

them. Varying circumstances.

Q. What did you tell this young man?

A. I told him I was going to give him the concentrated form of the gas that we had been operating on in the laboratory. He knew pretty well what it was, and he said that he knew that, while I might make him sick in an experiment, that he did not believe I would kill him; that he would leave himself to me—that he would run the risk.

Q. Made himself a martyr to science. A. No.

Q. Offered himself, I mean?

A. No, he didn't. I paid him for it.

Q. Well, now, Doctor, seriously do you think that those conditions would have some effect on the mentality of a man?

A. I waited five hours before the experiment began. I tried to eliminate those things. I tried to make it a fair experiment.

Q. But, I asked you what your opinion would be as to whether it would have some effect upon the mentality of a man. A. Which?

A. The conditions under which you performed that experi-

ment.

A. It would depend entirely upon the individual.

The Court: We will take a few minutes recess, gentlemen.

487 (Recess taken as ordered.)

The Court: Dr. Jones, take the stand, please.

Mr. Elliott: I have completed the cross-examination, if Your Honor please.

The Court: Any redirect examination, Mr. Butler?

Mr. Butler: Yes.

Dr. Jones, resuming the witness stand, was examined, and testified as follows:

By Mr. Butler:

Q. Dr. Jones, in your cross-examination, something was said about the effect upon blood pressure of tobacco and food and whisky, and so forth. What are the things which generally will increase blood pressure?

A. Why fear, anger, meals.

By the Court:

Q. What? A. Meals, Exercise.

Mr. Smith: Meals?

Mr. Butler: Yes-food.

A. (continuing) Stimulants of any kind, tobacco.

Q. Now, what degree may blood pressure be depressed before it is apparent, or objectionable? In other words, I wanted

to get the range of blood pressure.

A. Well, normal blood pressure may run in practical limits, say, between one hundred fourteen millimetres, and, say one hundred forty. When it gets beyond that point, we begin to suspect that there is some arterial or kidney case. When it is below that, we know that the vitality of the individual is reduced from some cause or other. Of course, there are exceptions in all these cases, but that is the average.

Q. Now, I understood you to say to Mr. Elliott that, if water contained more than three thousandths of one per cent.

nitrites, to a millionth part of water, it was rejected.

A. Yes, without knowing where it came from.

Q. That is, three parts to the billion?

A. Three parts to the billion.

Mr. Butler: I think that is all.

Mr. Elliott: That is all.

Witness Excused.

Gustav Mann, called as a witness on behalf of the Government, being first duly sworn, testified as follows:

## Direct Examination

By Mr. Butler:

Q. Gustav Mann? A. Yes, sir.

Q. Now, Doctor, will you speak distinctly. It is very hard to make ones self heard in this room, I have found. Where do you live? A. New Orleans, La.

Q. And your age, and profession, education, experience,

etc.?

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A. Am 46 years of age. Am at present professor of physiology in the medical department of Tulane university. Am also the head of the biological department of the academical section of the Tulane university. Am a doctor of medicine,

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and master of surgery of the Edinburgh university of Scotland, and bachelor of science of the Oxford university of England.

Q. Have you written any works, in the line of your profession?

A. I have published two books, the first dealing with physiological histology, published in 1902. The second book dealing with the chemistry of the body, published in 1906. In addition to this, I have written, altogether, about—roughly speaking,—thirty different papers, one dealing with plant physiology. I was awarded the Dobie Smith gold medal for that. Another, dealing with the chemical changes which the nervous system undergoes, during the time we are awake and

working. I was awarded the gold medal of Edinburgh university for my M. D. theses. I am at present work-

ing, particularly with the help of my assistants, on processes of digestion, paying particular attention to those products which are absolutely necessary for the maintenance of life.

Q. Have you made some study of the composition of bread made from wheat flour? A. Yes, sir.

Q. And the nutritive value of each of the constituents, or each of the principal constituents of wheat bread and flour?

A. I have.

Q. You may tell what the composition of bread is, and the nutritive value of the constituents?

A. If we don't take into consideration the amount of water which is in flour, we may, roughly, divide up the constituents which are of direct benefit to us as a food, in this way: Suppose there is one per cent of fat: There is, roughly speaking, 10 per cent of protein substance, and 90 per cent of starch, now, having, here, the proportion of one of fat to 10 of protein to 90 of starch. The most valuable constituent of flour and of bread is a protein. If I took all the starch, and if I took all the fat and fed a person on that, they would die very quickly of starvation. What is absolutely essential, is to have the protein, because the protein keeps us alive. The starch and the fat simply produce heat in the body. Now, the protein amounts, roughly speaking, to from 10 per cent to maybe 12 or 12½, but the essential food in the bread and in the flour goes by the name of gliadin or gluten.

Q. Do you use the word "Gluten" and the word "Protein" interchangeable, one as an equivalent of the other, in your

testimony?

A. Yes, in certain cases we do. When we speak of gluten, we mean the wheat product. The wheat product is the crude gluten. Then, this crude gluten may be divided into two portions, one which is soluble in alcohol, and one which is not

soluble in 70% alcohol. Now, the portion which is soluble in alcohol is different, chemically from the portion which is not soluble in alcohol. Now, the one which is soluble in alcohol contains for example, one of the most important constituents, namely, a compound called lysin.

Q. That is in it?

A. In the alcohol soluble. The alcohol-soluble compound, then, doesn't contain this compound which we will call lysin, but it contains very little of another compound which is absolutely essential to life, namely, triptophane. They are the two substances,—lysin and triptophane,—without which no one can live. The triptophane is contained in the alcohol-soluble, you see, and the other constituent is contained in the non-alcohol-soluble stuff.

Q. Are you familiar with the substance known in chemistry

as NO2, or nitrogen peroxide gas? A. I am, sir.

Q. Does that substance, diluted with atmospheric air in it, act upon the constituents of wheat flour, by reason of chemical action, either direct or indirect? A. It does.

Q. I would like to have you explain to the jury, if you can, the effect that it does have upon each of these principal constituents that you have mentioned—the fat, and the starch,

and the protein, or gluten?

A. The first substance on which the nitrous acid acts, is the fat. That happens before anything else, I should say, because the affinity of the nitrous acid to the fat, seems to be greater that the nitrous acid for anything else; but as soon as the 1 per cent of fat has been satisfied with the nitrous acid, then we have still an amount for, roughly speaking, 90 per cent of starch and 10 per cent of protein. Now, what I notice is that as soon as the nitrous acid comes into contact with fat, this fat being in the flour, not having been extracted, as I do with gasoline, the flour, is at once bleached—that is, the yellow color disappears. Then, I made some experiments which seem to show that there is a definite change in the chemical nature of the fat, because certain substances which it would normally unite readily, it doesn't unite with such substances-as, Soudan 3 or scarlet R and others. Now, this action on the fat I haven't stated in detail, but I have stated in detail the action on the starch and the action on the

protein, or gluten. Now, what I expected to find, is, that the action of nitrous acid on starch would give me sugar. I expected to find a good deal of sugar, but I didn't get a good deal. I tried different strengths of bleached flour,—1 per million—3 per million—4 per million and up to 4 per million I found no action whatsoever on starch which I

could demonstrate. But, after four per million, and up to 7 per million, I got a very slight action; to a very slight extent the starch was converted into sugar. That means there is nothing there to interfere, from the health point of view, with the flour. The slight digestion which occurs, there, in the starch, is evidenced perhaps, slightly, eventually.

Q. You don't get the effect upon the starch? This bell was ringing and I didn't hear it. Now, just in a word. Upon the oil, I understand you, in acts, first, and the first effect

is the bleaching of the coloring matter in the oil?

A. Yes, sir.

Q. Now, on the starch?

A. On the starch, when the nitrous acid acts on the starch in a strength greater than four parts per million, or greater, there is a very, very slight inversion of the starch into sugar. This change is neither—it is too small to do any harm, and it is practically of no value from a nutritive point of view. The change is so enormously slight that I had to take the ordinary tests and dilute them greatly, in order to be able to appreciate this.

Q. This is, as I catch your meaning—if the treatment of the flour by nitrogen peroxide gas, is in excess of four parts

to the million? A. Yes.

Q. Four parts of the gas to a million parts of the flour, then there would be only a very slight change in the starch, changing it into sugar? A. Into sugar.

Q. Now, if that continues, as the amount increases will the

change also increase?

A. No, sir. The curious thing, I expected it would, of course, but it didn't. The change is so very, very slight, that it may be utterly neglected. I didn't get what I expected, in the sugar, because as soon as we bring, under ordinary

conditions, an acid into contact with the sugar, the 492 starch is [as] once converted in the sugar. That is a -well known chemical fact, and I was, therefore, very much surprised when I didn't get it in the flour; and I have, hence, only to state the action of the nitrous acid on the protein, and this action of the nitrous acid on the protein may be divided up into several stages. There is what we may call an initial stage. Now, this initial stage of action on the protein substance gives me a compound which, if I simply look at it, seems to be the same as it was to begin with, but, if I take this gluten which has been acted upon in the initial stage with nitrous acid, get it in my hands, and try to string it out, I find it is short-it doesn't pull out into as long strings as normal gluten does. Now, secondly, in many instances, but not always, it is possible to tell a difference by smell. I have acted on the flour with nitrous acid, and I haven't waited more than a month, I can usually, but not always, tell a difference in smell. Now, in addition, here, to the physical changes, there is a distinct chemical change. Suppose I took gluten which has been acted upon by nitrous acid. Suppose I wash that gluten, free. That means that I take a certain amount of flour, and make it into dough, and let this dough raise for about an hour or two hours, then I wash it, wash it as much as I can with my hands, and I put it through a mincing machine-kind of a sausage machine. I get long threads. Wash it again. Make it into a roll and put it back in the sausage machine, and in this way, we get rid of most of the starch-leaves only a little. Now, if I take gluten which has been prepared in this way, or if I take some flour, it is possible to show that there is an increase in the acidity. There is a distinct increase in the acidity of the flour, as soon as any nitrous acid reaches this flour. Now, I thought, at first, washing flour, it would be quite easy to demonstrate this increase in acidity, but I found it was not any too easy. When I first tested the pure gluten, I couldn't

demonstrate a distinct increase, so what I had to do

493 was simply this—

Q. (Interrupting) Before that—when you say increased in acidity, I would like a little definition of meaning, as that word is here used, for it has been used in this case in two senses, one relating to mineral acidity, and the other relating to organic acidity. A. Yes.

Q. Now, which do you mean, when you say, upon being treated by nitrous acid, there is an increase in acidity?

A. There is always an increase of mineral acidity.

Q. You mean mineral acidity?

A. No, I mean, just now, the gluten acidity.

Q. Well, is that a mineral acidity?

A. No. That is an organic acidity.

Q. Very good. A. An organic acidity.

Q. But you say there is always-

A. (Interrupting) There is always mineral acidity. That is a simply chemical problem. There is no difficulty about that, If you put nitrous acid into any compound, for that, becoming nitrous acid, you must have mineral acidity, and there is no doubt about that, but we are in doubt, and the thing was, whether the protein which was in the wheat was so acted upon as to show a definite amount of increase in the acidity and I didn't find it easy to demonstrate. If I test in an ordinary way, I won't get any indication of an acidity. What I have to do—suppose this was the gluten. If I wanted to show the acidity, what is absolutely necessary, in the first instance, is, to add some alkali. Then, next, I have to convert my protein compound into a new substance, by the excess of caustic

products. That is an exceedingly difficult chemical problem. Of course, there are certain compounds that are so composite, suppose they are acids, and I add alkali in excess, instead of giving an alkaline reaction, I get a neutral reaction, and we have certain bases—certain alkalies, if I add any acid to them, and I add more acid than should exactly neutralize it, I got, again, a neutral compound, and this is what we call a psuedo-

acid, and psuedo-bases. Now, what actually determines, in the test, is, if I add these psuedo-acids and psuedobases, by addition of alkalies beyond the needs of that

protein compound, I don't know which I have, so I add a certain amount of alkali, say one part to two parts alkali. The, I titrate that backwards, and when I titrate that backwards I get a distinct increase in the acidity. The increase in the acidity of the albumin being equal to about 1-10th of a cubic centimeter of a [-] of hydrochloric acid for one gram of flour. I repeat that: The increase in acidity is equal to a [-] of hydrochloric acid, expressed so, per gram of flour. So, there is no doubt as to there being, after the addition of nitrous acid, [and] distinct increase in the acidity of the protein compound of wheat.

Q. Then, as I understand your testimony, with respect to the effect of this nitrogen peroxide gas upon the gluten, or protein, your points are these: That, at first, the appearance

does not seem to be changed much. A. Yes.

Q. But the elasticity of the gluten is lessened, or diminish-

ed, as I understand? A. Yes, sir.

Q. And there is a distinct chemical change in the gluten, we will say. A. Yes, sir.

Q. And, further, the mineral acidity is increased by the ad-

dition of the nitrous acid? A. Yes, sir.

Q. And, that there is also worked a change,—an increase, as I understand your explanation,-in the organic acidity of the gluten? A. Yes, sir:

Q. Now, any other changes that you have observed, or demonstrated, by the use of this gas, upon gluten of wheat flour?

The next change, which is perhaps the most interesting. is, that there is a great deal of difference between ordinary flour which has not been bleached, and flour which has been

bleached. As soon as I test the digestibility, I find there is a great deal of difference between the digestibility of flour which has been bleached and flour which has not been bleached. The digestibility is impaired.

O. The digestibility is impaired, is the further point you have made since my last question? A. I beg pardon?

That the bleaching of flour by this nitrogen peroxide gas, impaired the digestibility of the gluten? A. Yes, sir.

Q. Now, with respect to the quantity, or consideration of the quantity of the nitrogen peroxide gas employed, not to the whole volume of the flour, but to the constituents of the flour, acted upon by the bleaching reagents, can you express to the Court and jury a comparison, what five parts of nitrite nitrogen would be, if measured, not against the whole volume of the flour, but against the portions of the flour which had been act-

ed upon?

A. The question is simply this: Suppose I take 100 parts of flour. My experiments have shown that 90 parts of the flour, composed of starch, are practically not acted upon, at all. That leaves me with 10 per cent which is acted upon. Now. suppose I have 100 parts of flour, and only 10 parts of the flour are acted upon, and 90 parts are not acted upon, it follows that, if I use a certain quantity of gas, and put it into that flour, this gas which I put into the flour concentrates all of its power on that 10 per cent of the gluten,-not on the 90 per cent of the starch, and, therefore, if I say, for example, 5 per million, it isn't really 5 per million, at all. It is 5, about 100,000. That means it is 1 in 20,000. It isn't one in 200. 000, but 1 in 20,000, in as much as nitrous acid concentrates all its action on the 10 per cent of protein which is present, and therefore, it is erroneous to speak of. say, 5 per million. It isn't 5 per million, at all. is 1 in 20,000. That means the action of the nitrous acid is really ten times as strong as is claimed—as is said to be. The nitrous acid is really 10 times stronger, in its effect on the pro-

tein—on the gluten of the wheat,—than we are lead to expect, by mere listening to such a statement as "there

is 5 per million".

Mr. Butler: Did Your Honor intend to adjourn about this time:

The Court: Just as you say.

Mr. Butler: I would prefer it, before entering upon another branch of the examination.

Whereupon court stood adjourned to 2 o'clock p. m.

Kansas City, Missouri, June 7, 1910.

Pursuant to adjournment, Court met at 2 o'clock p. m., Tuesday, June 7, 1910, and proceeded with the trial of said cause further as follows:

Gustav Mann, resuming the witness stand, was examined further, and testified as follows:

## Direct Examination (Continued)

By Mr. Butler:

Q. Doctor, have you made any studies for the purpose of determining the effect upon digestibility of flour, that results from treatment of the same with nitrogen peroxide gas, mixed with air, and thereby bleaching it? A. I have.

Q. Have you been able to determine whether or not such treatment has any effect upon the digestible, of the flour, or

any of the ingredients of the flour?

A. The effect of nitrous acid upon flour is this effect, that it makes the gluten much less digestible, compared to flour which is not bleached.

Q. You said nitrous acid. Now, this Alsop bleaching process employs NO2, nitrogen peroxide, and N2O4, being the same thing under different conditions of temperature, I understand.

Mr. Elliott: If your Honor please, I don't think Mr. Butler ought to testify as to what this Alsop process does.

Mr. Butler: That is the proof in this law-suit.

The Court: Oh, Mr. Elliott, I am not much of a chemist, but I assume that statement is something that any Court can judicially notice, isn't it?

Mr. Butler: That is the statement in their patent, in the very words of their patent. I don't understand it is denied

The Court: Go ahead.

By Mr. Butler:

Q. Upon the introduction of such gas, mixed with air, into the flour, what chemical changes take place, directly, if any?

Are there any acids formed?

A. Yes. As soon as the nitrous acid meets with the flour, as we have 10 per cent of water in the flour, we must have the nitrous acid pass into solution—I mean the nitrous acid and the water, together, give me two things; firstly, very dilute solution of nitrous acid; and, secondly, a solution of nitric acid, and, in that, nitrous acid and nitric acid are formed in equal amounts.

Q. What is the character of the substance known as nitric

acid?

A. It is a very strong, corrosive acid, an acid which undergoes strong electrolysis. That means it is one of the very strongest acids which we could possibly deal with.

Q. What is the effect of nitric acid, upon organic matter,

like the flesh, or a piece of bread, or flour?

A. Everything will depend on the amount of nitric acid, in relation to the amount of protein. If I have a great deal of nitric acid, and the amount of albumen, the whole of albumen becomes changed in such a way as to become an exceedingly poisonous substance.

Q. What would be the effect of pouring nitric acid upon

bread?

A. The effect is exactly the same as adding nitrous acid to flour, which contains 10 per cent of water.

Q. What effect would it have upon the color of bread?

A. The color of bread will be changed from white into yellow.

Q. Have you, yourself, done that, since you were on the

stand this morning? A. Yes, sir.

Q. Have you brought the bread to court? A. Yes, sir.

Q. (Handing to the witness a plate containing two pieces of bread) Are these the pieces of bread, upon which you poured nitric acid? A. Yes, sir.

The Court: That was the nitric acid?

By Mr. Butler:

Q. That was the ordinary nitric acid, of commerce?

A. It is the ordinary nitric acid I found upstairs in the laboratory.

Q. You may show them to the jury.

(Witness does so.)

Q. Describe this change in color.

A. The change in color-

Q. (Interrupting) Well, wait a moment, until the jury has completed its examination.

## A Juror:

Q. Did you have some butter on the bread?

A. No, sir. Ordinary bread. I got two samples of bread, one of them was bleached, and the other was unbleached, and I poured nitric acid on both.

The Court: Just wait a moment. One of those pieces of bread is made out of bleached flour?

The Witness: Yes, sir.

The Court: The other, unbleached?

The Witness: Yes, sir.

A Juror: Which one is bleached?

The Witness: I can't tell you. I'll tell you as soon as I see it, but I can't tell you, otherwise. (Examining the exhibit) Excuse me, please, Judge, because the light is poor, here, and I can't see. (Carries the exhibit to a window.)

A. (Continuing) The bigger slice is the unbleached, and the smaller slice is the bleached.

By Mr. Butler:

Q. This bread you procured in the laboratory of the United States Government, on the floor above this floor, in this build-

ing? A. Yes, sir.

Q. Now, describe the change worked in the color, by this nitric acid, poured upon these pieces of bread, and the chemical changes that would result from such an operation, if you know

what they are?

- A. This reaction which we get, here, with the bread, and with all protein substances, with all gluten, for example, is a reaction we have to teach our students, when they become medical students. It is quite a common reaction, and it is known as the xanthro proteic reaction,—simply a yellow, protein reaction.
  - Q. That is, a yellow, protein reaction? A. Yes. Q. The xanthro protein? A. Xanthro protein.

Q. Now, let us pause long enough to fasten that word in

mind. That is xanthro-

A. (Interrupting) Xanthro proteic reaction, and it is due to the fact that all compounds in such gluten, which apply to the benzol series, undergo a definite change, so, what is formed in this particular instance, is, firstly, what we call diazo compounds. That means when nitrous acid is brought into contact with benzine rings, the benzine ring becomes changed. If it has attahed to it what we call NH2 hook, an ammonia radical, it becomes changed in such a way as to give rise to diazo compounds. Now, this particular diazo compound reaction is extensively used by manufacturers, of aniline dyes, to produce yellow colors, brown colors and red colors. Now, a subsequent change to this, is, that the nitrous acid, acting upon these very same compounds, gives rise to a substance very closely related to picric acid. Now, as soon as we get to these diazo com-

pounds, we are dealing with a compound which is an

500 exceedingly poisonous substance.

Q. This yellow colored substance in the bread, where the nitric acid was poured by you,—is that poisonous?

A. I beg pardon?

Q. The yellow patch in each of these pieces of bread—is that poisonous? A. Very poisonous.

Q. That is the xanthro proteic compound? A. Yes, sir.

O. Is this nitric acid the same substance as is produced in the flour by nitrogen peroxide, employed by the Alsop process, for bleaching? A. Yes, sir; it is.

O. And is the chemical action the same, in kind, differing in

degree only, as the quantity differs? A. Yes, sir.

Q. Does such treatment affect the digestibility of gluten? If I have once produced an xanthro proteic reaction, all

digestibility is made impossible.

Q. When the treatment has been by a medium strong enough te produce the xanthro proteic substance, then it will not di-

gest? Is that it? A. Yes. That is true.

- O. Now, from your studies and experimentations, have you been able to ascertain whether or not the treatment of flour, by nitrogen peroxide gas, will affect the digestibility of gluten of the flour?
- A. Yes. Very minute quantities of nitrous acid, when added to the flour, will completely change the digestibility of the flour.

O. You said nitrous acid. Is that the equivalent of NO2?

A. That is the equivalent of NO2.

O. Because the nitrous acid is the immediate and direct result of the application of the gas to the flour, I take it?

A. Yes, sir.

- Q. Now, I would like to get you to describe to the jury, the degree of impairment, resulting from the treatment of flour by nitrogen peroxide gas, diluted with air, taking into account the amount of treatment.
- Well, what I actually did, I took, first of all, some flour I bought in New Orleans, which is supposed to be a high patent, winter wheat flour, and this goes by the name of "Golden Drop".

The Court: Golden Drop? 501

The Witness: Yes. If you will allow me I will just show you (Referring to chart).

By Mr. Butler:

Q. Do you happen to know where that flour was milled? No, I do not, sir. In the first instance, I took some flour which I bought-

The Court: (Interrupting) Just a moment. Do you gentlemen agree where this Golden Drop flour is manufactured?

Mr. Smith: Never heard of it.

Mr. Butler: Did you ever hear of it?

The Court: No.

Mr. Scarritt: Must be in Nevada, somewhere.

The Court: I don't know that I ever heard of it.

By Mr. Butler:

Q. You don't know whether it was milled in New Orleans, or not?

A. No, sir. It was bought in New Orleans by Doctor Jones, and it has since staid in my laboratory, and it was said by the man who sold it—

Mr. Smith: (Interrupting) Wait a minute. I don't think we ought to come that far.

The Court: He was about telling where it was coming from I don't know.

By Mr. Butler:

Q. It was bought in the market in New Orleans?

A. Bought in the market, in New Orleans, and it was stated

to be a high patent, winter wheat.

Q. When you bought it, and when you received the flour, did you ascertain whether or not it contained nitrite reacting material?

A. Yes, sir. Didn't react under the Griess reaction, nor to

any other test.

Q. So, you determined that, in the first instance, when you received it, it didn't contain nitrite reacting material?

A. I did.

The Court: You say it did not?

A. No, Judge, didn't contain any.

By Mr. Butler:

Q. Now, what did you do with the flour? You may de-

scribe the details of your experiment to determine?

A. I generated nitrous acid, by acting on starch with nitric acid, and this gas was collected, and then I took and measured different quantities, of this nitrous acid, and added it to the flour, and I added it in such proportions as to—if I may just consult my notes?

Q. When you say nitrous acid-

A. (Interrupting) I mean the gas.

Q. Nitrogen peroxide gas?

A. Nitrogen peroxide gas. I used it in 1 per million, 2½ per million, and 5 million.

Q. That is, you treated different quantities of the flour,

in different degrees? A. Yes, sir.

Q. And when you say 1 per million, do you mean one part of the nitrogen peroxide gas, per million of flour, or one part of nitrogen peroxide gas, computed as nitrogen?

A. No-as NO2.

Q. As NO2? A. Yes.

Q. That would be much less than 1 part computed as nitrogen. A. Yes.

Q. Go on.

A. Now, having in this way subjected the flour to the action of nitrous acid, what I next did, was, to take a measured quantity of this bleached flour, and exactly the same kind of unbleached flour, and I always started, simply to keep my hands clean in making it, in the first instance, working up the unbleached flour, and then I took the bleached flour. Suppose I had a pound of one, I had a pound of the other. If I added a certain quantity of water to one, added the same quantity to the other. Then I kept both of these doughs—I made it all

up into a dough, and I put them under a faucet and let 503 the water run on them, and wash it and wash it until

I couldn't get any starch out of this dough.

Q. Now, let us pause there. You treated both flours—the bleached and the unbleached—alike? A. Yes.

Q. And made doughs? A. Yes, sir.

Q. And then you washed the starch out of the doughs?

A. Yes, sir.

Q. Now, how is that done?

Well, I took this dough and let the faucet run on it, and A. worked it with my hands, and got out most of the starch, and then the gluten came together, and I got a fairly round ball, and I continued until I got a mass which I could hold in my hands, and it was more or less sticky, and after having done that, I got it as dry as I could, by squeezing it, and then put it in a sausage machine, passed it through the sausage machine about ten times, so I got long strings coming out, looking like macaroni, and in that way I found it was possible to get rid of a great deal of the starch. It was still in the gluten, and having got rid of the starch, as much as I possibly could, both from the bleached and from the unbleached samples, I took one in the left hand and one in the right hand, and went on squeezing the dough for the same length of time, with about the same amount of force, so as to get two doughs which had practically the same amount of water. I tried to treat them in every way, exactly alike, so as not to introduce any atom, and having done this, having squeezed it and squeezed out as much water as I could out of the dough, sometimes in a half an hour, sometimes in three-quarters of an hour. Then I took these two pieces of dough, and put them on clean glass plates. Then I started using a number of glass tubes, and these glass tubes I connected up with a suction apparatus. After connecting up the two glass tubes with the suction apparatus, I got the gluten, which was remaining in there, into the two tubes, and, having the gluten in the two tubes. I then took the tubes away and boiled them,-

in some instances I boiled them, and in some instances 504 I didn't boil them. But, suppose I took such a tube-a glass tube, which was filled with the gluten, I boiled it for three-quarters of an hour. Then I took a file, and cut this long glass tubes into a number of pieces, from an inch and a half to two inches in length, so, I had in the one glass tube, bleached, and in the other glass tube unbleached gluten. Then, having, in this way, made a number of segments, say, an inch and a half to two inches in length, I had one bleached and one unbleached glass tubes filled with the gluten, and I took them and put them into a big bottle, and into this bottle I put gastric juices-the juice from the stomach, or pepsin-pepsin with hydrochloric acid one part pepsin and one part of hydrochloric acid. with two parts water. Then these tubes were put into an incubator, exactly at the same temperature, and by that I marked the digree of digestibility, and see whether one tube would digest more quickly than the other. Suppose this, here, is a tube, and I have got in here gluten. Of course, the tubes are much finer. Here, the digestive fluid can only act from here. There it can act from the sides, and, gradually, as it acts on this gluten, it begins to digest the gluten, and the amount of digestibility will differ, in different conditions. Now, what I always found, was, that the amount of digestion was much greater, in the unbleached, than in the bleached flour.

Q. Was that a uniform result in all cases that you tried

the experiment in?

A. In all cases where I used gastric digestion. I have only examined in the pancreatic digestion, or in the gastric digestion. The bleached flour always showed that it digested much more slowly than did the unbleached flour.

Q. What are we to understand by "gastric" digestion?

A. Stomach digestion.

Q. And by "pancreatic" digestion. Is that what you call it?

A. Yes. From what some people call the "sweet bread"—the abdominal sweet bread. Now, suppose, in the first instance, I had a digestion, from here to here (indicating on a bottle).

What I did, I held the tube against the light and took a very fine pair of compasses, and measured that distance.

Now, inasmuch as I had, sometimes, very little digestion, it was necessary for me to get accurate data, so, having a very fine pair of compasses, having measured this distance, I took a piece of smoke glass, and scratched the smoked surface with the pair of compasses, which would leave two lines on the smoked glass. Then I took the smoked glass, and put it under the microscope, and I magnified the image, in that way, sometimes 20, sometimes 50. That is, suppose it was one inch, here, on the smoked glass. I magnified it until its distance was 50, so,

under the microscope, we are able to see slight differences that we would not be, otherwise, able to see. Now, suppose, in one case, I had a digestion from here to here (indicating), and from here to here in the other case. I take these two measurements, and they express the amount of digestibility, in these colors which you see here (referring to a chart). These colors are indexes to the digestibility. This red indicates the digestion of the flour which was not bleached.

Q. Which was not bleached?

A. Yes. And this black indicates the flour which had been bleached.

O. And the amount of digestion is indicated, how?

A. The amount of digestion is indicated by the height of the color. That means, the higher the column, the more the digestion, and the shorter the column, the shorter the digestion.

Q. So, the unbleached digestion in proportion as the red

column is to the black column, on this paper?

A. That is, in this particular case, in the ratio of 38 to 26.5.

Q. Now, that was "Golden Drop" flour, that was bought unbleached?

A. That was bought unbleached,

Q. And you kept some [ot] it unbleached, and bleached some of it?

A. Yes, sir.

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Q. And compared it? A. Yes, sir.

- Q. And that paper, you have marked 2.5 per million. What does that mean?
  - A. That means 2.5 per million of NO2.

Q. Used to bleach the flour?

A. Used to bleach the flour.

Q. And how long after the flour bleaching by that medium, did you make your experiment? A. Two days later.

Q. And what does that 56 mean?

A. That is the length of time expressed in hours. 56 hours after I commenced to digest, I got this condition. 56 hours.

Q. Now, you told us that you bleached some of this flour one part per million—by use of one part per million of nitrogen peroxide, as I understood you,—when I first entered upon this branch of your examination? A. Yes, sir.

Q. Did you make experiments with that?

- A. I did, and the ratio of the unbleached to the bleached, was as 100 is to 87.
- Q. Yes, or 100 parts of the unbleached would digest while 87 parts of the bleached would digest, under like circumstances? Is that it? A. Yes, sir.

Q. And then I also understood you to say-

Mr. Elliot: (interrupting) Just one minute. Was that experiment that you just referred to, with this same flour?

The Witness: Yes, sir.

Mr. Butler: I understood him, Mr. Elliot, he used quantities of this "Golden Drop" flour, and bleached some of it with one part per million, 21/2 parts per million-and that is represented on the chart-and then 5 parts per million, and it is sae last one, now, that I am asking him about the result.

Mr. Elliot: 5 parts?

Mr. Butler: 5. He said 1 part was 87 to 100.

Q. And this is what—2½ is how much to 100? A. (Referring to chart) You see—

Q. I know, but the result of your experiment, as shown on the chart,-may that also be expressed in figures? Counting the unbleached portion 100, what would the bleached portion be? A. 87.

Q. Of digested material? A. Of digested material.

Q. And that is the same, when it was bleached 1 part 507 per million, too, as it is when it was bleached-

(interrupting) No. In the case of 21/2, it was as 76 is to 53, or as I put it down here,-I divided it,-38 is to 26.5.

Mr. Helm: Mr. Butler, will you get the different experiments and the different figures?

Mr. Butler: Yes. Let me finish the next question. Then I will come back and summarize it all, so it will be clear on the record, and clear to you.

Q. Now, on 5 parts?

A. At 5 per million, the ratio was, as 75 is to 40.

Q. Now, we will back up, and state them all in the same terms. In the instance where one part of gas per million parts of flour was used, the digestion was, unbleached 100, bleached 87? A. Yes, sir.

Q. Where 21/2 parts of gas were used, per million parts of flour, the unbleached digested how many points? A.

While the bleached digested— A. 53.

O. 53? Where 5 parts were used, the unbleached digested-

A. 75.

Q. 75? And the bleached digested— A. 40.

40? Q.

Mr. Butler: Does that make it clear, Judge Helm?

Mr. Helm: Yes, sir.

By Mr. Butler:

Q. Aside from these experiments, have you compared the digestibility of this same "Golden Drop" flour, unbleached, with other flours which you tested for and found to contain nitrite reacting material, of the kind that is introduced in the treatment of flour by nitrogen peroxide gas, diluted with air?

Yes, sir. I had sent to me by the Government, alto-A. gether, nine samples. I knew nothing whatsoever about these samples, excepting they indicated to me the amount of nitrites which they had recovered.

Mr. Elliot: Now, may I interrupt just a moment. Are 508 you going to ask him to compare the digestibility of this "Golden Drop" flour with some other flours?

Mr. Butler: Yes.

Mr. Elliot: Well, then, your Honor, we will object to that, because it is manifest you can't make comparisons between two different flours, and it would have no relevance, whatever, to any issue in this case. So far as he confines himself to comparisons between the same flour, bleached and unbleached, that is one thing, but, now I understand the witness is going to make comparisons between this flour, and some other flours that he doesn't know anything about.

Mr. Butler: He knows that they contained some nitrogen peroxide gas, or the nitrite reacting material.

The Court: Yes, but how would he know the other ingredients?

Mr. Butler: He made no analysis as to that.

Mr. Elliot: These two flours showed different digestibility.

Mr. Butler: Oh, I understand. I don't claim that all flours are alike.

Mr. Elliot: Well, that is my objection to this experiment.

Mr. Butler: I see your objection, perfectly, and concede it what force I think it is entitled to. We have now shown, by the witness, that he obtained some flour sold in the market, and treated some of it, and left some of it untreated, and we find that digestibility is impaired, quite substantially, increasing as the amount of nitrogen peroxide gas, employed for bleaching, increases, that the digestibility decreases as the Now, this question calls for this commedium increases. parison, namely, this same Golden Drop patent flour, marketed in New Orleans, compared with other wheat flours, which he tested, and found contained nitrogen peroxide gas.

Mr. Scarritt: Mr. Butler, do you mean our bleached 509 flour?

Mr. Butler: This is bleached flour. Not in this immediate question, I don't Judge Scarritt. No. I will be careful to state it just as it is. He was sent 9 specimens of flour, the history of which he doesn't know, by one of these bureau heads, and he entered upon the comparison of the digestibility of the flour, having ascertained that each sample gave the nitrite reaction test, and has made memoranda of the results of that, disclosing what will be shown.

The Court: Some bleached, and some unbleached?

Mr. Butler: Yes, sir. His standard was the "Golden Drop" unbleached, compared with flours of unknown brands, or origin, so far as he is concerned, bleached.

The Court: As to digestibility?

Mr. Butler: Yes, as to digestibility. Now, the objection is this, that there is no foundation laid, because flours are known to differ in digestibility. That is as I understand it.

Mr. Scarritt: And in quality.

Mr. Butler: And in quality and strength. Now, that is the position of the gentlemen on the other side, I think, fairly stated.

Mr. Scarritt: Well, it doesn't enlighten the Court, or the jury, if your Honor please, with reference to the flour in question,—a comparison between this "Golden Drop" flour that he has tested, here, and flour that he don't know where it came from, or what their quality or strength is, or what they were made out of—what kind of wheat, whether winter wheat or spring wheat, or whether soft wheat or hard wheat. It can throw no light on the subject, at all. It is absolutely immaterial to this question, as to what is the digestibility of the flour in question. It is simply consuming time, when we don't get any benefit from the consumption of the time. It seems to me altogether beside the case, and the issue

here. The issue, here, is, so far as this question is concerned, what is the digestibility of the flour in question—the flour that was seized? Now, as Mr. Butler said, it is admitted, on all hands, that there are no two flours exactly alike, and a comparison between an unknown flour, would not shed any light, at all here, as to the digestibility of the flour in question. It is, therefore, absolutely immaterial to any issue in this case.

Mr. Butler: I hadn't concluded my statement when Judge Scarritt commenced his.

Mr. Scarritt: I beg your pardon.

Mr. Butler: I was undertaking to state my understanding of the point of the objection. I am very glad, however, Judge Scarritt, to have had your views, before I concluded my statement.

Mr. Scarritt: You are welcome.

Mr. Butler: As to why I think this testimony may properly be received. It was not admitted on all hands that there are no two flours alike. It is undoubtedly the fact that there is great variation in digestibility of flour. Now, the proof, so far, on this subject, shows that when you treat the same flour with this Alsop bleaching process, as it was described in the patent, digestibility is impaired, proportionate to the degree of treatment. Take two flours, one bleached, and compare it with the other, unbleached, and we have these results. So the proof stands.

Mr. Helm: Mr. Butler, the proof doesn't show this was flour bleached other than in the laboratory, by the chemical process.

Mr. Butler: Yes, I know. This testimony shows it was bleached by nitrogen peroxide gas mixed with air, one part per million, 2½ parts per million, and 5 parts per million. The proof shows that the Alsop process employes nitrogen peroxide gas, mixed with air, and it doesn't make any difference where the gas is made, whether from decomposing

animal matter, chemicals in the Torelli (?) method, which

Doctor Wiessner claims is infringed by the Williams method, or how. The nitrogen peroxide gas is the bleaching reagent, wherever produced. The amount used in this case, 1 part of the gas per million, is, under the proof, less than 1-20th of that added to the flour seized in this law-suit. Now, our next step is, taking an unbleached flour of commerce, and comparing it with the bleached flours of commerce, wherever found,—and, as we will later prove, these samples sent to him were samples of flour seized by the Government as adulterated, in shipment, or at least some of them, and I think all.

The Witness: Two were not.

Mr. Butler: All but two then. Seven of the nine,—all but two samples—were samples of flour seized by the Government as bleached flour. He found that it gave the bleaching reaction. Now, aren't these objections all to the weight of the testimony, and not to the admissibility of it? If, as in the case of this bread (referring to the two pieces of bread heretofore mentioned), digestibility is inhibited by this treatment, may that not be shown? If it is impaired, may it not be

shown? And they say it doesn't shed any light upon this flour (referring to flour contained in Government's exhibits 8 and 9). We haven't any of Brother LeFlange's flour, so far as we know, that wasn't bleached by two bleachers, in full action upon it, at the same time. The question we are trying to get at, is, whether it hurt that flour. It does hurt the "Dew Drop". It does hurt everything that we can find, as compared with the "Dew Drop", and our next step will be with that flour (referring to Government's exhibits 8 and 9), out of those bags, which fails to respond with other flours found here in Kansas City, and we will show that the divergence is great. All of this tends to prove that the digestibility of that flour in that

bag, shipped in interstate commerce to B. O. Terry, after it had been bleached by two bleaching machines, on the 512 31st of March,-more than 60 days ago,-is now impaired as to digestibility. It is merely the manifestation of the operation of a law of chemistry as certain as the law of gravity, as certain as anything can be, and I think it is proper to show how bleached flour, or flour found with this nitrite reacting material in it, digests. How fast does it digest? How fast do wheat flours, bleached digest? There is variation, in all flours,-perhaps in the same sack, caused by a different head of grain, maybe. One may have been blighted the other ripened naturally. There may have been some variation, but, where it is great, where it is evidence of the operation of a law that is certain, it seems to me it is proper evidence to show how this thing worked. It seems to me it is admissible evidence. Of course, if the variation be so slight as to be accounted for by difference of digestibility in the flour, itself, the testimony is not of weight, but, where the divergence is wide-and I haven't undertaken to state what it is, because it would be manifestly improper to do so until your Honor has ruled upon it-but, does not that determine the admissibility? If the experience be uniform, it would manifest the operation of a law which tends to prohibit any digestion, when sufficient quantity is used. It seems to me it is admissible evidence. I am not speaking of its weight; that comes later.

Mr. Elliot: Now, Mr. Butler having given some testimony-

Mr. Butler: (Interrupting) Mr. Elliot, if I gave any testimony, I certainly was not trying to do so.

Mr. Elliot: Well, you said that flour was injured. Isn't that testimony?

Mr. Butler: I said-

The Court: Oh, let it go.

Mr. Butler: Just a moment. Mr. Elliot, I didn't intend to do anything of that kind, and if I have stated anything, I wish to withdraw it. I am not trying this case that way, gentlemen. The testimony [shown] that this flour was treated by this treatment, and did not digest. Now, that is his testimony.

Mr. Elliott: His testimony was that, by his laboratory experiments, he got a difference in the rate of digestion. Now, that's all that can go to the jury. You, nor the witness, either, has a right to say under your Honor's ruling, that that flour is injured. But that wasn't my point, your Honor.

The Court: Let me ask you a question. There have been a great many questions asked, here, with reference to whether the flour was bleached by the Alsop process, or by the chemicals used in the laboratory. The witnesses, so far, in their testimony, in chief, have said there is no difference, provided, always, of course, it is the same quantity, pro rata. I see Judge Scarritt shakes his head at that. Now, that's the way I understand it. Am I right, Judge Scarritt?

Mr. Scarritt: I believe not, your Honor. They have said that that is relatively correct.

The Court: Sir?

Mr. Scarritt: They have said that it is relatively correct, because, in every instance, they have shown that they introduced this gas into a closed receptacle with the flour, and shook it up, and that, under the same conditions it would be the same, but they have shown the conditions were different.

The Court: Well, let me ask you another thing. Is there any difference? You take issue that the witnesses have thus far, said, whether nitrogen peroxide is generated (if that is the word) by the flaming arc playing on atmospheric air, and if it is generated by the use of sulphate of iron, or in the laboratory, or in any other way?

Mr. Scarritt: We take issue, that the difference in the application of it—

The Court: Oh, no. I didn't ask you that. Of course, I don't care to cross-examine you, Judge.

Mr. Scarritt: That's all right, your Honor.

The Court: But you don't understand my question. Are you going to bring chemists here, that will testify that nitrogen peroxide is anything but nitrogen peroxide?

Mr. Scarritt: No, sir.

The Court: How?

Mr. Scarritt: No, sir.

The Court: Regardless of how made,—whether by the flaming arc, or sulphate of iron, or in the laboratory?

Mr. Scarritt: Or any other way. But, if your Honor, please-

The Court: (interrupting) Now, just wait. Don't get excited. That a nitrite is a nitrite, wherever formed? When bread is made, is there any difference?

Mr. Scarritt: I would like to ask your Honor, or somebody that knows, if they have ever seen a nitrite, and what it looks like? I haven't found out what a nitrite looks like, or what it is—whether it is an animal, or a vegetable, or a mineral.

The Court: Well, we are not making any progress. I wanted to see whether we could narrow the issues.

Mr. Scarritt: That is my idea exactly, your Honor. It would be interesting, but not valuable, as evidence, for this gentleman to go ahead, and introduce nine other issues in this case, which are foreign to the issue which we have under consideration. He wants to bring out something about nine other flours we don't know anything about, and in the gluten of which, as had been testified to here, time and time again there is a difference in the digestibility, right straight along. There has been no dissent, as I understood the evidence, although I am not a chemist, and don't pretend to know anything about

half of what is being said, here, but I have learned this, that all of these gentlemen for the Government have 515 testified that there is a difference, and a vast difference. in the digestibility of the gluten, of which this gentleman is talking and in the different flours. Now, in order to obtain even an approximate relative sameness in the tests, the conditions must be the same. Now, if these nine other cases are introduced, the question will naturally arise, as your Honor can well see, and as you have the right, under the rules of evidence as I understand them, to decide, and to anticipate that it will have to be determined under what conditions the gas was introduced into the flour, what the quality of the flour was, where it was raised, what they had in it in the first place, how old it was, whether it was whole wheat flour or middlings, or these other kinds of flours that this gentleman and

the other witnesses have talked about—all those questions come into the solving of this proposition. Now, if we are going into those questions, and determine minutely as to the

relative quality and the digestibility of the gluten, in each one of these nine flours, we are going to be here nine years; and I think, in the interests of time and because it throws no light upon the direct issue made by the libel in this case and the answer in this case, that it ought to be cut out, so far as the ultimate effect is concerned I don't fear that, at all, because any man of ordinary, common judgment can see that it has no effect on the issue in this case, and that is, as to the quality of this flour in question. Every miller makes a different flour. That has been testified to, here. Depends upon the mill and the efficiency of the miller. All those questions enter into it and it seems to me we are wandering wide of the mark, in this case, by going into this sort of testimony, and it is for that reason, and especially in the interests of saving time, that I insist upon suggesting to the Court my reasons for these objections.

Mr. Elliot: I was just going to suggest to the Court, being quite calm, now—

516 Mr. Butler: Are you going to talk awhile, to save time, too?

Mr. Elliot: Under the libel, as Judge Scarritt states, it is claimed that this flour was bleached by the Alsop process, and that it has been injured in certain respects. Now, of course, if your Honor please, we admit the bleaching by the Alsop process, but we deny that the flour has been injured in any respect.

The Court: Now, right there. Are you going to tender an issue, that it makes any difference whether it is bleached by nitrogen peroxide, by the Alsop process, to-wit, by the flaming arc? I just want to know. Now, I think I am making no criticism on Judge Scarritt, or Mr. Smith,—you seem to be the chemistry lawyer of this suit.

Mr. Scarritt: I admit that, your Honor.

The Court: Do you claim it makes any difference, whether the nitrogen peroxide is carried into the flour containing 10 per cent of water, when it is generated by the flaming arc, to-wit, by the Alsop process, and a like quantity generated by the laboratory, or by sulphate of iron, or anything like that—any other method?

Mr. Elliot: That is just the point, your Honor, if this gentleman shows—

The Court: (interrupting) Oh, no. Hold on. Do you understand my question?

Mr. Elliot: Yes.

The Court: What do you say about this?

Mr. Elliot: I say if this gluten is injured by that process-

The Court: (interrupting) That's your answer, is it? Well, all right.

Mr. Elliot: Now, I say distinctly that there is no evidence—

517 The Court: Oh, we are not talking about that.

Mr. Elliot: (Continuing) lining up the laboratory method of bleaching, with this Alsop process of bleaching, and, of course, we are going to say there is a difference.

The Court: Now, then, hold on a moment. Now, you Alsop people, and the Andrews people of England, joined teams, and in the courts of England and France and this country your people, and the Andrews people, combining, to use the street expression to "jump onto" the Frenchman, Frichot, didn't you?

Mr. Elliot: There is no evidence of that.

The Court: Oh, no; but the 168th Federal report that has been in this court—well, isn't that so?

Mr. Elliot: No, sir.

Mr. Scarritt: Now, the issues are made in this case, and let's stick to the pleadings.

The Court: Let's talk about that Frenchman.

Mr. Scarritt: I don't think we ought to talk about foreigners.

The Court: Now, you said, Mr. Elliot, that the Frenchman's process injected nitrogen peroxide in there by a chemical?

Mr. Elliot: No, indeed we didn't.

The Court: You did not?

Mr. Elliot: No.

The Court: Then I have read to no purpose.

Mr. Elliot: The Frichot patent was introduced in evidence to defeat the Andrews patent, but the other side tried to show that it used nitrogen peroxide in there, and failed in it, and the court said it didn't anticipate it. It was an ozone generator.

The Court: All right.

Mr. Elliot: I don't want to bring this out, your Honor. All I wanted to bring out was the uselessness of this.

The Court: The question I have in my mind, Mr. Butler, is this. While I am disposed to be against you, 518 largely on another matter, but in a general way covered by Judge Scarritt,-for instance, two flours might be of unequal digestibility, because the one carried a greater amount of protein and gluten, or fat, or bran, or the outer layer next to the bran, or something of that kind, so that, for this witness to answer this, wouldn't we then have to find out, before the comparison became of any great value, as to what were the component parts of the other flour, regardless of nitrogen peroxide? Wouldn't we? Wouldn't we get off into an indefinite field, by making this comparison? It looks to me like we would. Now then so far as I understand it, these comparisons have been made between the same flour, to-wit, the "Golden Drop", bought in a grocery or provision store in New Orleans, in which this gentleman took part of it to his laboratory and bleached it, 1, 21/2 and 5 parts, making three tests of the same, identical flour, less the nitrogen peroxide. that is fair. Suppose we take another flour. How can that throw light on it? Here we take the same flour-the so-called "Golden Drop", and, of course, that is only a fanciful name -without knowing where the wheat was grown, or where manufactured,-and comparing it with some flour that we don't know from whence it came, or where milled,-aren't we getting into a field of uncertainty? It looks to me like we are.

Mr. Butler: I will withdraw the question.

The Court: I will sustain the objection.

(Examination of Dr. Mann continued)

Q. From your professional training, experience and experimentation, what is your opinion as to the effect of nitrogen peroxide gas applied to flour, as it is applied by the Alsop process of bleaching it upon the digestibility of the flour and of bread made from the flour?

A. As the result of Alsop's treatment, the flour and the bread made from it or any other article manufactured from that flour is distinctly very much diminished in nutritive

value.

519 Q. And as to digestibility?

A. And that the digestibility of any article made from such bleached flour is greatly less than that of the unbleached flour previous to treatment.

Q. Why is that true; what is the reason for that?

A. The reason is that, as soon as the nitrous acid, which is generated by the Arc comes into contact with the mass, why there is a certain percentage, about one-half, of nitrous acid converted into nitric acid, and this nitric acid acts directly

upon the gluten which is present in the flour and is present in any article manufactured from that flour, and the action of the nitric acid, which is formed from nitrous acid by oxidation,—the damage done, is directly proportioned to the amount of nitrous acid which has been put into the flour.

Q. In view of Mr. Elliott's understanding of your testimony with respect to this "Golden Dew Drop" experiment

which you have described-

Mr. Scarritt: There is no "Dew" in there.

Mr. Butler:

Q. "Golden Drop". Let me understand whether or not the impairment of digestion of gulten indicates or is an in-

jury to the flour and bread made from the flour?

A. Inasmuch as gluten of the flour is the most essential constituent, if by the separation of its most essential constituent from the rest of the flour, I can show that this protein does not digest as rapidly as it would otherwise, if it had not been bleached, I must arrive at the conclusion that owing to the gluten being much less digestible, that therefore there is an extra amount of work on the body and therefore instead of being able to digest in a given time two loaves of bread, I can only digest one loaf, or to put it more distinctly, if I take a meal of bread I have to take twice the length of time to digest that bread if it has been bleached.

Q. Is that an injury to the food, the lengthening of the

time of digestion and digestibility?

By Mr. Elliott: Do I understand the Doctor to say it takes twice as long to digest bleached flour bread?

By Mr. Butler: He said, by way of illustration, for 520 example if it takes twice as long to digest a beefsteak, it is not as good a beefsteak. Is it your understanding that the impairment of digestibility in that way is an injury to the food. A. Yes, sir.

Q. Can the extent of the injury to the flour bleached by this Alsop process be determined by the amount of nitrite reacting material recoverable from the flour at any given time

after the bleaching?

A. No, sir, it can not.

Q. Why not?

A. Because, if I have a certain amount of nitrous acid this nitrous acid is gradually converted into nitric acid and the amount of damage which is done to the gluten will depend directly on the length of time the nitrous acid has been in contact with the gluten; therefore, if the flour is bleached to-day, the amount of damage which is done to the gluten is not so great as will the damage be, say a month hence or two months hence

or six months hence. We must take into consideration—the time factor, and I have here a definite proof of that in an experiment made of some flour so bleached, per million. Your Honor, this is a flour which was sent me by the Government and this does not come under the heading that the flour bleached and unbleached of 2.5 per million.

The Court: The same flour?

The Witness: The same flour, which I have here on the chart; one bleached and one unbleached.

The Court: The one bleached, what percentage?

A. 2.5 Per million.

Mr. Butler:

Q. What is the result of that?

A. The result of this flour—I don't know when it was bleached, but definitely, it was in my laboratory for over a week before I experimented, and comparing the digestibility of that flour which was bleached exactly the same extent of that grade and proportion, which is much greater—

By Mr. Elliott: What did you compare it with?
521 A. I compared it with this (indicating chart).

Mr. Elliott: That comes under your Honor's ruling.

(The Court hereupon took a recess for a few minutes, after which time the further examination of the witness was continued as follows, to-wit):

By Mr. Butler:

Q. You may give us your opinion whether or not the treatment of flour by the Alsop process for the purpose of bleach-

ing it affects digestion by the pancreatic fluid?

A. Yes, there is a difference between the bleached and unbleached flour as far as the pancreatic digestion is concerned. All these experiments by pancreatic digestion require a very great length of time. I have found the flour very, very slowly digested by the pancreatic digestion, where it is very quickly digested by the stomach. In some cases after five days digestion, there is a difference between the two of practically a ratio of 6 to 4. Now, a curious thing, is when I apply pancreatic digestion and I have a bleached flour, what happens? In the first instance instead of digestion beginning to dissolve away, the bleached flour begins to swell. Having these tubes, suppose I have some gluten in here which has been bleached; instead of digestion showing by the substance being taken away, what happens? There is a considerable swelling beginning. I

never noticed it with unbleached flour, but as soon as I begin with bleached flour, it is getting more instead of less.

Q. Now does it make any difference as respects the effect upon flour from NO2 how the NO2 is made, whether by the Flaming Arc such as is described in the Patent of the Alsop process or whether it be made by chemicals or in any other way?

A. No, sir; nitrous acid is nitrous acid the world over.

Q. Assuming a flour be so treated by adding air and nitrous acid gas and adding these nitrites to it, does it make any difference whether it is done in a large glass bottle or whether it is done by the mechanism of a process which conducts the gas from an electric arc generator through a receptical or tank

and then into an agitator—Does it have any different effect upon the flour assuming that each method adds a like amount of nitrite reacting material?

A. No, sir, I don't think that makes any difference whatsoever.

Q. Is nitrogen peroxide a definite chemical substance?

A. Yes, very definite.

Q. Is the reaction taking place when it comes into contact with water and flour definite? A. Absolutely definite.

Q. Well known? A. Yes.

Q. Acts certainly? A. Absolutely certain.

Q. Have you any opinion based upon observation as to the effect of nitrogen peroxide upon the tissue of any plants or animals?

A. Yes, sir, I made a whole number of experiments with bleached flour on a certain plant which is in the habit of catching insects and digesting these things.

Q. Let us go a little slow until we understand that plant; we do not have it here, I think. We do not where I am. What is the name of that plant? A. Drosera.

Q. You say it catches insects?

A. There are two species; one has a flat leaf. Imagine my fingers to represent it, and a number of tentacles on its surface, and a fly settles on that. Each of these tentacles has a little drop of viscid material on it; the fly rests on that and the tentacles close over it and it is digested; and the juice excreted by these leaves is very similar to the juice excreted by our stomachs, and the acid in it is hydrochloric acid.

Q. The leaves close up over the insect and then secretes juices comparable to the gastric juices of the stomach, and

digests the insect? A. Yes, sir.

Q. Is that a part of the feeding process of the plant?

A. Yes, sir.

Q. Now, have you tried any bleached flour on that and compared it with the same amount of flour unbleached?

A. Yes, sir.

Q. Now, you may describe the result of that to the jury?

By Mr. Elliott: I object to that as incompetent, irfelevant and immaterial, what effect it has on insects that are on some sort of plant down in Louisiana.

Mr. Butler: That is not quite it; What effect does the nitrite reacting material have upon it.

By the Court: Overruled.

Claimant excepts,

A. These plants are built up of a number of cells, just as we are built up of a number of what we call cells. Here is such a cell (indicating on chart). This cell has got inside it little sacs which we call nuclei,—

Q. Let us go a little slow, and see more about that. The chart which you have made reference to in your last answer includes, as I observe it four different figures, am I right about that?

A. Well, there are more. There is one, two, three and that is four.

Q. Now each figure represents what?

A. A certain condition either of resting or different stages of digestion.

Q. A certain condition of rest, and a certain condition of digestion?

A. No, this is the same before anything reaches it.

Q. This picture, does it indicate a microscopic view?

A. Yes, sir.

Q. Of what?

A. This picture shows a microscopic view of the various cells which together lay right over the tentacles which I previously described.

Q. That is cells of the leaf of the plant known as Drosera?

A. Yes, sir.

Q. These were prepared by you from your own experiments?

A. Yes, sir, this is all my own work. Now the magnifica-

Q. We will mark this section by the letter "A" for example, so that we can refer to it more definitely; the next one, we will mark as "B", and the next "C", then "D" and "E". We will refer to the whole chart as Government Exhibit No. 11; Now, this chart, Government Exhibit "11" was made by you?

A. Yes, sir.

(The Chart was here marked for identification "Gover't Exhibit 11, F. T. L.")

524 Q. And indicates, as I understand it something in connection with your observations of the effect of flour bleached and unbleached, that is, being the same kind of flour bleached and unbleached, upon vegetable tissue, being the leaves of the plant known as Drosera, is that correct?

A. Yes, sir.

Mr. Butler:

Q. Now give Judge Scarritt an opportunity to present an objection, if he has one.

By Mr. Scarritt: If I understand it, you mean the action of the flour itself upon the vegetable.

By Mr. Butler:

Q. Was it the flour itself put upon the plant?

A. No, the gluten.

By Mr. Scarritt:

Q. The gluten of the flour put upon the plant and the effect it has upon the plant?

A. Yes, sir, particularly on this part here "A".

By Mr. Butler: These particular pictures of microscopic sections of calls which are marked "A", "B", "C", "D" and "E" respectively indicate something of the result obtained by your experiment.

By Mr. Scarritt: We object to that as being immaterial to any of the issues in this case.

By Mr. Butler: I had not put the question. I wanted as preliminary to the objection to show what the studies indicated here which you will describe, if permitted to, indicate. Do they show the comparative effects upon the tissues of the plant, of the different kinds of gluten, one from bleached and from unbleached flour? A. Yes.

Q. Now, you may describe the experiment.

Mr. Scarritt: We object to that because it is immaterial to any issue of the case. It is too remote and uncertain in its application to the issues in this case; because it is not contended that the flour in this case or the "Golden Drop" or any other flour is fed to the human race as flour, and it does not relate to the effect that the eating of bread made from

any flour might have upon the human system; even if it 525 did, there is no testimony and no natural conclusion that the action even of the bread upon a certain plant, would have any relation to the effect upon the human system, and further, in the interests of time, I object to the question.

By the Court: The witness may answer.

Mr. Scarritt: We except.

Q: Speak distinctly and slowly enough, to describe your

experiments in detail.

A. In the first instance, I should like to point out there is absolutely no difference whatsoever between plant and animal cells as soon as we came to the question of digestion. Having been engaged in this particular work for over ten years.

Mr. Scarritt: I object to this argument.

The Court: Yes, get right down to the question, please.

The Witness: In this particular case, this first figure here shows the cells of which the Drosera is composed, this magnification from here to there (indicating).

Q. You are now pointing to "A"?

A. I am pointing to "A". This indicates the resting condition of the cell; that means a cell that has been given no nourishment. Now, what is going to happen when I feed that cell, is indicated in "B", "C", "D", and "E" and "F". As soon as I feed this cell, if I put some gluten on this Drosera, what happens is some of the material which has been digested goes into the cell; in consequence of this material passing into the cell, I get at once a change in this chemical laboratory of the cell, in consequence of this.

Q. When you say "chemical laboratory" you are pointing

to a disk like arrangement—what is that called.

A. The nucleus.

Q. Changing it from the appearance that is in "A" to that in "B"?

A. Yes, sir, and still later, which is presented by "C". That gluten—as soon as food reaches the cell, the cell begins to make some use of the food, to work it up, and the use of this

is shown in a varying way. This little blue spot here—,

526 Q. Now, when you say "here" those who read this record will not be able to look at you, so, if you will say "near the circumference of the nucleus" on "A" then we will understand it.

A. Yes, sir. The blue areas marked here in the nucleus in the first figure "A" we must compare them with the figure "B" and we find these small areas have enormously increased in size; they are enormously increased in bulk. Here in "C" the increase in bulk is much more marked than it is in "B". Now, the time taken to produce this change from "A" to "C" differs with the kind of food which I give. If I give food which is easily digested, I can produce such a change much more quickly. To give you one instance; I made a number of experiments with white of egg and with various products which

I get by the digestion of white of egg. Those changes from "A" to "C"—If I fed to the plant a hard boiled egg, taken from 30 to 36 hours to produce, the same change from "A" to "C" I can get in from 7 to 10 minutes if I give digested

white of egg.

Therefore, I have here, when I study these figures a direct indication as to the ease with which a certain substance is assimilated; the more difficult the thing is to digest the longer will it take for "A" to be changed into "C". Now taking such leaves and feeding them on bleached and unbleached flour, I find the difference between these two figures here, say between that first one—

Q. That is between the nucleus in "A" and the nucleus in

"B"?

A. Yes, sir, a difference of ten hours on an average. That is to say this change represented here in "B" is produced by unbleached flour in 20 hours, and it will take with bleached flour, 30 hours; therefore, I reason that the bleached flour is much less easily digested by this plant than is unbleached flour. Now, if we look and compare "C" with "D", to see what is going to happen next, then you see this blue material here in figure "C" which is the so-called nucleus, hemoglobin, it becomes less marked.

Q. When you say "becomes less marked" than the "C" you indicate "D".

A. That we cannot demonstrate—

527 Q. You indicate "D"?

A. "D" is less than "C" and "E" is less than "D".

Q. As soon as this material which you call the nuclei hemo-

globin changes, the nuclei grow less?

A. The protein substance begins to get less and first of all, this enzyme oxide, that is this material, is used up and degenerated, giving rise to that very enzyme which that plant needs for its digestion. You come here to "F" which shows you after three days this cell has passed back—

Q. When you say "This cell"?

A. The figure "A" cell, represented in Fig. "A" has been converted into a cell which looks again like "A"—"F" looks like "A", which means that cell is once more in a resting condition; that means it is ready to take up some more food. Now, these results which I got here, I get with unbleached flour, the same "Golden Drop" and this Golden Drop which had been bleached to the extent of 2.5 per million. Now, in addition to these experiments, in addition to having this effect of producing this slowing of 30 hours from twenty hours, in addition to this effect, I have a number of experiments in which I used a much higher bleaching, I have used four per million, and I have used—

Q. How many parts per million of Nitrogen Peroxide gas were used upon the bleached flour to get the results that you have described from your pointing out to the chart just now?

A. 2.5 per million, the same which I showed in the previous

chart.

- Q. Now, you made other experiments with other degrees of bleaching? A. Yes.
  - Q. What other degrees?

A. The highest was 13.6 per million—I went on to bleach the material until it got the same color as the bread which is there. Now, that is so exorbitantly bleached, which is beyond all question and never met with anywhere except artificially—Now taking 13.6 per million and putting it on the leaf—not this particular species of Drosera but another species, I could not get hold of the same species this year, but I got hold of another species with long leaves with all the tentacles sticking out here. Upon this particular Drosera I put

one lump here of unbleached, then slightly bleached, 528 more bleached, and heavily bleached, all on the same stalk so as to have a direct comparison between the different effects produced by the different flours, and I found when I put this heavily bleached 13.6 material on here, that the leaf changed and it looked, to begin with, to the naked eye as if it was diseased, if I used that very heavily bleached material, which give me a nitrogen ...... and ..... equal to 56 at least. To begin with, I did not realize what I was doing so I put the most heavily bleached flour at the bottom and in consequence that leaf died off until the whole leaf bent over. So to have the same conclusion, I put the most heavily bleached material at the top of that leaf, and the less bleached at the bottom so as not to have that degeneration happen to that leaf.

Q. For what reason is there such a difference in the digestion by this plant of flour—bleached and unbleached: What is the reason for that?

A. As soon as the nitric acid, into which the nitrous acid is converted comes in contact with these protein substances and all these protein substances, there is induced a chemical change in the protein substances, in addition to which I have the direct action of the nitric acid on the enzymes which have been already formed, so I have two things. First of all the action of the nitrous acid in the proteins on the enzymes and second the action of the nitric acid on the cell itself. So there are two actions; the action on the enzymes and on the cell itself.

Q. What is the effect of taking food containing such nitrite reacting material into the stomach?

A. Suppose I take bread which contains nitrite, suppose I take sodium nitrate which is used medicinally, as soon as that nitrate comes into the stomach, as soon as the stomach begins excreting, it excretes hydrochloric acid, as soon as that nitrite comes in contact with the hydrochloric acid, there is liberated at once free nitrous acid. If I have, for example, sodium nitrate and hydrochloric acid which I have, the nitrite I get

from the bread and the hydrochloric acid I get from the stomach, as soon as the sodium nitrite and the hydrochloric acid of the stomach meet, I get formed sodium

chloric acid of the stomach meet, I get formed sodium chloride which is an incompatible salt, and free nitrous acid, which free nitrous acid coming in contact with water, you get 50 per cent nitrous acid and 50 per cent nitric acid, the percentage being directly proportional to the amount of nitrites which I introduced.

Q. Now, will the action in the stomach be the same whether it be a nitrite reacting material that is found in the flour bleached by the Alsop process or whether it be the nitrite of the saliva or the nitrite of hams or of decaying food, or anything of that sort?

A. Yes, sir, the nitrite always performs in the same way.

Q. No matter how the nitrite gets into the stomach?

A. No difference-it makes no difference.

Q. No matter how it is made, whether by a flaming arc, or by decomposition or the smoking of hams or whatever it is?

A. No, nitrite is a definite chemical substance.

Q. Now, in case of over treatment sometimes spoken of over bleaching what is the effect, first upon the color of flour

-that is, the excessive treatment?

A. Well, we have to distinguish two distinct things. The first is the action of the nitrous acid on the oily material which becomes bleached, then the second change which we get, the change which is indicated in the bread, has nothing whatever to do with the oil—the second change is simply a change produced by the nitric acid acting on the gluten which means an impairment, a changed gluten into that substance which I have called the zante protein substance.

Q. The bleaching effect is the action of the nitrous com-

pound upon the oil? A. Yes.

Q. What takes place if you keep on adding N. O. 2 diluted with air?

A. Then it effects the gluten and changes the gluten.

Q. What effect upon the color?

A. The color will gradually become more and more yellow from the comparison with the color—

Q. On these pieces of bread that you put nitric acid upon to-day?

A. It is not as intense as that. It is like the color of a new straw hat; it is much paler than that (indicating 530 bread).

Q. Now you speak about the effect upon the color; now the effect upon the substance itself as to the condition of the poisonous food, what effect has over bleaching or over treatment or long exposure to this gaseous medium in the manner

of the Alsop process, upon that matter?

There are contained in the gluten two substances which are absolutely essential to human life. Now one of these substances is tryptophane-indol-amino-propionic acid: Now this substance, the tryptophane is absolutely essential to digestion. If I take a dog and give that dog nothing but gelatin jelly, such a dog will die of starvation; if I take this gelatine and add typtophane to it, such an animal will live. If I take milk and digest that milk with pepsin or trypsin, that tryptophane is still there and if fed to the animal he will still live. If I take my milk and digest it with hydrochloric acid for example and destroy the tryptophane—and I have made an extensive number of experiments in the last six months on this point,the tryptophane is destroyed and the animal can't be kept alive. The tryptophane, which I speak of, is the substance which gives rise to that yellow color. There is no substance in the whole of the gluten which gives rise to the vellow color with such intensity as does this tryptophane. These experiments which I have made, if I take the color such as that I may not be called to demonstrate tryptophane; all the samples which were submitted to me by the Government upon which I could not testify-in all these samples of bleached flour which were given to me, I tried to compare the amount of tryptopane and found, with the amount of tryptohpane found in unbleached flour, and I found no difference. Now, comes the other question; there is a second substance called Lysin, and now this substance lysin is just as important as tryptophane, I used material which had been given to me by the Government, which I can't testify to, but used material which I had treated with nitrous acid to the extent of 2.5 per million, and 5 per million.

Now, I found on doing this that the amount of lysin in 2.5 per million in the unbleached flour was 1.92 and that 1.92 is to the bleached flour as 1.76. Now, this lysin is so important a substance that if it be absent from the food the

so important a substance that if it be absent from the food the animal can't live. It follows then that from this flour which was bleached to the extent of 2.5 per million, this substance which is only present to the extent of 2 per cent in normal flour—I get lower figures because I crystallized more roughly—my figures are somewhat lower than the figures in the books—

my figures are constantly lower because I crystallized the thing half a dozen times, at least, to make sure of the right proportion —You see the substance is only 2 per cent in this flour, still even subjecting it to 2.5 per million reduces this amount, and it is absolutely essential to life. If we have tryptophane present and lysin is absent the animal will die. A whole lot of experiments made by others and I made experiments myself.

Q. Did you make experiments of the effect upon lysin by a

treatment of 5 per million? A. Yes, I-

Q. If 2.5 per million reduced it from 1.92 to 1.76 what did the 5 treatment do? A. I did not use five but I did 10.

Q. What did the 10?

A. 50 grams gave me .53, that is 100-

Q. Well, express it in the same way you did with respect to the 2.5, so as to make the result easily comparable?

A. Yes, 100 grams would give me—instead of giving me 1.92, as in the case of unbleached flour only gave .66.

Q. That is you start out with bleached the amount 1.92?

A. No, sir, the unbleached.

Q. You treated that with 10 parts per million?

A. Per million.

Q. And you have a result of zero-point 66? A. Point, 66.

Q. 1.92 reduced to .66 that is what it means. What substance or chemical or element was there to reduce the lysin which you say it so essential?

A. The nitrous acid after it is converted into nitric acid.

Q. Now, as to the effect upon people of different age, capacity and strength, a given amount of this nitrite reacting material found in the bleached flour bread, what can you say about that. Would the effect be the same in degree or different?

A. It is a difficult question to answer. Supposing you take two people; supposing one person was in good health, the other person was not in good health. It is quite possible the person that is not in good health will have a gastric secretion which is lessened in amount, in which the pepsin is not as vigorous as it is in the healthy individual. Now, inasmuch as there is a deleterious action of the nitrous acid on the enzymes, I would expect that a person who is not in good health would suffer more than a person in good health. The next point would be if a child could eat the same amount of bread as an adult, if there were nitrites present such a child would suffer more than an adult—I say, if a child could eat the same amount of bread.

Q. What is your opinion as to whether or not the adding of this nitrite reacting material to flour and bread made from flour in very small, minute quantities is injurious or may be injurious to the health of consumers?

A. Now everyone that is here has some nitrite in his mouth. Now, what happens is that this nitrite in our mouth we are accustomed to. That means, we are constantly swallowing a certain amount of nitrite every day and the body has got accustomed to deal with this amount of nitrite. That is, our body is compensated for that amount of nitrite. Now, when I say we are compensated for it, it means the body, as we grow older has gradually got accustomed to deal with the amount of nitrite which is normally present in the mouth; but that nitrite which is not normally present in the mouth we have to compensate for; that means we are spending energy to undo the effect of that nitrite, and therefore I should say, inasmuch as we have to compensate already, don't let us introduce any more.

We are doing already work in compensating for that 333 amount of nitrite in the mouth and therefore, I say don't add any more nitrite to any food whatsoever,

whether it be flour or bacon or anything else.

Q. And the tendency is what, is it in favor of well being or injury to health of the adding of nitrites to foods made from flour?

A. I think it is distinctly injurious to health.

#### Cross Examination

By Mr. Elliott:

Q. Doctor, I notice in your testimony, you have frequently, I think referred to nitrous acid where we have been using the term nitrogen peroxide. Do you make any distinction between those two gases?

A. If you like to make a distinction, there in none.
Q. I simply ask you if you make a distinction?

A. No, if you have a dry gas—You say, of course, you have a dry nitrous oxide, whether you call it N2O4 as soon as you have that in contact with water, you have nitrous acid in the water.

Q. That doesn't answer my question. Do you make any distinction between nitrous acid and peroxide nitrogen?

A. No.

Q. What is the formula for nitrous acid? A. HNO2.
Q. What is the formula for the peroxide? A. N2O4.

Q. You say that is the same thing?

- A. Exactly except one is in a watery solution.
- Q. You say nitrogen peroxide is the same thing as nitrous acid.
  - A. And nitrous acid is a watery solution of NO2.
  - Q. Is there any hydrogen in peroxide nitrogen?

A. No.

Q. Is there any hydrogen in nitrous acid?

A. Naturally, because it is in solution. As soon as it passes into the water the gas becomes a solution. You have the hydrogen taken from the water and unites with nitrous acid to give you HNO2.

Q. Has nitrous acid, as such, ever been isolated or located by

chemists?

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A. Demonstrated? Oh, yes all all you have to do is to take any nitrite and add acid to it and you lead off the nitrous acid into the V-shaped tube, then you get the—

Q. Nitrous acid is only known as a solution?

A. Only known in solution.

Q. It is only known to exist by chemists for the reason they can find nitrite?

A. No, it is of a distinctly blue color; free nitrous acid in a watery solution is a distinct blue color.

Q. Nitrous acid gas, as such has not been isolated by chemists; it is not possible? A. Say that again?

Q. Nitrous acid gas has never been found by chemists?

A. Of course it has.

Q. It has?

A. Yes, that is exactly what NO2 means.

Q. You say nitrous acid gas has been isolated as such by chemists? A. Yes.

Q. It is known otherwise than in solution?A. I am sorry I don't make myself clear.

Q. A thing that is in solution is not a gas?

A. Most decidedly.

Q. I asked you if nitrous acid gas, as such has ever been isolated and found by any chemist?

A. Yes, Mr. Elliott. Q. You say it has?

A. Because salt, as soon as you put salt—if I take salt and put the salt,—common table salt, into water, according to.......'s law, it is so I have a gas, which is no longer sodium chloride; that is.....law, and one of the principal basic laws of chem-

istry; you can't get over that.

Q. I don't ask you to get over anything. I just simply wanted you to straighten out some things here. Perhaps this is unimportant, but you have referred to nitrous acid several times, when we have been referring, as I understand it, to nitrogen peroxide. I do not know whether the jury understand that or not. You say that peroxide nitrogen has been in certain instances used in bleaching flour. I understood you to refer to it in terms of nitrous acid. Now, I ask you does nitrous acid, as such bleach flour?

A. No, it becomes first converted into nitric acid.

Q. You say nitrous acid, as such will not bleach flour?

A. No, sir.

O. Now, I want to ask you what knowledge you have of this electrical process of bleaching flour, what has been your experience with it?

A. I have had none whatsoever. I have never seen the

Alsop machine.

Q. Therefore, you have never analyzed the gas; you don't know its dilution or anything of that kind?

A. No, I do not.

Q. You don't know, as to any gas you may have used in bleaching, how it would compare in dilution or concentration with any gas that might be used with this Alsop machine, do you?

A. No, excepting I have had some materials for comparison,

that is all.

Q. You say you never examined the Alsop machine, never saw it?

A. No, sir.

Q. Then you can not know what the gas is? A. No.

Q. Now, then, as to the flour in this suit, have you done

anything with that flour?

- A. What I did with that flour since I came here. I was summoned here by telegram; I went to Mr. Winslow and asked him to procure for me a flour which in every respect was similar to that flour in this case.
- Q. That may be, but just answer my question first; you can tell these things afterwards: Have you made any experiments with the flour in this suit?
- A. I have and found its digestibility only half that of normal flour.
- Q. What other things happened—Where did you get this flour that was seized?
- A. This flour that was seized was given me by Mr. Winslow, and it was sealed up.

Q. It was the same flour? A. It was the same flour.

## Mr. Scarritt:

Q. He has not said, it was this flour?

The Witness: I understand it is the same.

# By The Court:

Q. The flour that was given to you, that you analyzed was given to you by Mr. Winslow?

A. By Mr. Winslow.

The Court: Who is Mr. Winslow?

A. He is the head of the laboratory:

536 By Mr. Butler: He is an Inspector.

The Court:

Q. Is he a gentleman here representing the Government?

A. Yes, sir.

The Court: It is easy to see whether it is out of this seized flour or not.

Mr. Elliott:

Q. You had some of this flour that was seized, is that it?

A. Yes, sir.

Q. The other flour, you say you compared with that?

A. Mr. Winslow wanted to give me a sample to compare with this flour, and I would not have it, so I sent him out to the mill and he told me the miller gave him flour which was exactly like this flour and I compared the two.

Q. You had this flour and some other flour?

A. Yes, which was sent to me likewise.Q. It was some other flour? A. Yes.

Q. Now, I understood you to testify that you found no impairment in the starch in flour with such experiments you

made? A. None whatever.

Q. Now as to these digestion experiments that you have spoken about, all the flour used, as I understand it was flour that you had bleached by the use of peroxide nitrogen in your laboratory?

A. Some of it, and some of it was sent by the Government.

Q. That which the Court permitted you to testify to, that was all bleached in your laboratory? A. Yes.

Q. Now, I will ask you as to that flour that you bleached, Doctor, what change if any was made in the color of the flour?

A. Well, the first thing I noticed in using minute quantities, say 1 per million, was that the flour looked much whiter.

Q. Was that that white flour that you used in making your digestion experiments with?

Partly, and partly flour which had not been bleached.
Q. I mean as to the bleached flour? A. Yes.

537 Q. You used a flour that had been rendered lighter in color by peroxide nitrogen? A. Yes.

Q. Now, if I understood you, you said that you washed out the gluten from that Golden Drop flour bleached and unbleached and you were unable, as I understood it, to detect any difference in the color of the gluten, is that correct?

A. No, I would not go as far as that, by simply looking at it, after I had squeezed it out and put it on the table I got two lumps to look at, the same flour a slight difference in

color.

Q. I will ask you if you did not testify you did not detect any difference in color of the gluten from the bleached and the unbleached, isn't that what you stated?

A. If I said it, I did not mean to because what I referred to, there was two lumps here which were indistinguishable from one another as far as size and consistency was concerned.

Q. I was asking you as to color?

I found a distinct lighter color in the material I have bleached.

Q. The bleached gluten was lighter than the other in color, was it. A. Yes, sir.

What did you mean, then otherwise it was indistinguishable?

I mean I had got two lumps of the same size and same consistency, but not the same elastic stress.

They were distinguishable as to color, were they?

Yes, that is the color—I was not thinking about color when I made that statement.

Q. In what respect were they indistinguishable?

As far as bulk was concerned. You see, I took exactly the same weight of flour on every occasion; I treated it with the same amount of water; treated it to the same amount of washing; I took it exactly the same number of times through the sausage machine until what I had in that was as much in one hand as the other.

And one lighter than the other? A. Yes. Q.

538 Q. And that was the gluten from the bleached flour? A. Yes, sir.

Gluten is protein isn't it? A. Yes.

Q. Q. I want to ask you what is the action of peroxide nitrogen on protein in matter; what change does it make in its color?

Everything will depend on the amount you add. If you add a very small amount, it will make no change.

Q.\_ This was white?

A. Well, that is due to the fat; you see you can't get rid of the fat.

Q. What is the action of peroxide nitrogen on protein matter, will it make it yellow?

A. Yes, if you have enough.

I find that you in your book on chemistry of proteids so stated, and I will give you the page number?

I don't know what I have stated there.

That the action of peroxide nitrogen on nitrous acid on protein matter is to turn it yellow?

Yes, so I have, and I still belive it is so. It is quite

I have said it, and it is right too.

I think it is on page 236 of Dr. Mann's book of the chemistry of proteids:

The Court: Here is the book, if you want it. That is your book is it (Handing witness book). A. Yes sir.

Q. Well, would this illustrate it: You have been talking

about xanthroproteic action- A. Yes.

Q. (Reading) "Xanthroprotein and other nitro-substitution products are acid in character and possess a yellow color which on adding a fixed alkali, is converted into a reddish brown."

-That will illustrate it, will it? A. Yes.

Q. Is it not a fact that irrespective of bleaching that two flours from different mills will show differences in the rate of digestibility, of the rate of digestion.

A. Yes, particularly if you are comparing whole flour with

patent flour.

Q. May not two patent flours—alleged patent flours, or patent flours that are called "patent flours" from different mills show difference in the rate of digestibility?

539 A. Oh, certainly.

Q. I want to ask you what kind of nitric acid you poured on that bread, was it concentrated nitric acid?

A. Yes, that was concentrated.

- Q. Now, the action of nitric acid is distinctly different as to the possibilities of compounds being formed, whether it is dilute or otherwise, is it not?
- A. Yes, sir, and the length of time you must take the time factor into consideration.
- Q. Let me use an illustration I used with Dr. Jones this morning; if you use dilute nitric acid and added benzene it does not produce any compounds at all, does it? A. No.
- Q. If you use a still stronger nitric acid it may produce or will produce a substance called . . . . . . . . nitrite benzene?

A. Yes.

Q. Then if you go higher, and use a concentrate you can get a substance known as.....nitrite benzene?

A. Yes.

Q. So two chemical substances may be formed according to the concentration, and then by the dilution no compound at all, is that correct? A. Oh, yes.

Q. I want to ask you in your digestive work, with these tubes you have talked about, if you estimated the water contents of the gluten in each case?

A. No, but what I did is to treat one solid exactly against the other.

Q. Just tell me now, did you estimate the water contents of each set of gluten, the bleached and unbleached?

A. No, I did not.

Q. Isn't it a fact water may materially affect the rate of digestion?

A. Certainly but I don't know which one there was more water in, whether there was more in one than in the other.

Q. You did not estimate it? A. No.

Q. I want to ask you what is the usual way of estimating the rate of digestion is it not by taking the digestive material and estimating the nitrogen in it?

A. There are several ways in which digestive experiments are done; that particular way which I adopted is a mod-

540 ification of Metts' principle.

Q. What is the more usual way of making a determination as to the relative digestibility between two substances; isn't it done by determining the amount of nitrogen in the two cases?

A. No, the usual way in every well conducted laboratory is to use Metts' method because it is deemed most accurate. You see, what you have to do in the other case is to introduce,—

Q. One moment, Doctor-

Mr. Butler: Let him continue:

Mr. Elliott:

Q. Now, I won't put this in scientific language. This was handed up to me. Is it not the most usual way by scientists that is to have used a definite amount of gluten, then determine the amount of digestion by estimating in the filtrate the nitrogen and then to figure out the gluten? Isn't that the ordinary way of doing it?

A. You may do it that way.

Q. Isn't that the ordinary way? A. Not with me.

Q. I say with scientists. Do you know that is the ordinary way of doing that? A. I assume I am not a scientist.

Q. Not at all, I beg pardon. With other scientists?

A. Well-

Q. Isn't that the common way given in the books known to all men who deal with the digestion?

A. True, but then I am perfectly well informed with that method and I amusing it every day, but the difficulty comes to be if you want to compare two things, you see it is exceedingly—practically impossible to use that method for that reason—

Q. Why?

A. Supposing I have a lump of this size a big piece or thing I want to digest; The digestion does not take place from absorption, but takes place right through the whole thing. I have got the enzymes penetrating the whole thing.

Q. It takes place in the whole thing in those tubes you used?

A. No, that is where my sharp line of demarkation comes in.

Q. It don't go into the interior at all?

A. Only a very small part; don't you see, from having protection here on all sides, and having only one surface

541 free, having this surface lowermost, you see I handle this tube in that fashion (illustrating) so what is digested drops off and this remains unaffected from any side except here.

Q. That is, you mean it may drop out?

A. Must, that is the whole principle of digestion making it insoluble, otherwise there would not be any reason for the experiment.

Q. You say it is impossible to make a determination; why

is it impossible?

A. Suppose those breads, here, the thing which is being digested, the different radicals in the protein molecules digest in a distinct way, so it is quite possible for me to have a certain amount of digestion going on here which is not indicated at all by my nitrogen determination. You see, if you digest a big molecule, likely it will break it up into two portions and these are divided again and again and so, only ultimately, until your digestion is completed, do you get any comparable figure.

Q. That is the reason you don't use it?

- A. If you go to any laboratory where accurate determinations are made, for example of enzymic action or any other, we use the Metts' method.
- Q. Notwithstanding all flattering allusions to my chemical knowledge, I give you my word I never saw a digestive experiment in my life and I do not know a thing about it except what these gentlemen tell me. Now, I am informed that the determination of the nitrogen in the filtrate is the one reliable way of ascertaining accurately the rate of digestion, now, do you agree with that? A. It is one way.

Q. Then, I say they tell me it is absolutely the only accurate way of determining it, do you agree with that?

A. No. sir.

Q. Now, I understood in your testimony one circumstance, a suggestion of experiments the results were not unfavorable to bleached flour—what was there to that?

A. I just want to call for the question, because you see I can't answer—(Question read to witness) One sample was sent by the Government, I can't testify on that.

2. What was the first digestive fluid you used, what did

you name it.

542 A. The first I used was pepsin, the second I used was trypsin.

Q. The other was pancreatic?

A. Yes, may I have my book to give the exact figures to Mr. Elliott?

O. I don't want the figures, unless you want to give them

to me, I have not asked you for any figures, Doctor?

A. I would be glad to give them to you. In Number "9", bleached to the extent of 0.16, according to Government statistics the pancreatic digestion was worse in the unbleached than it was in the bleached.

Q. That is the condition you alluded to in the pancreatic

action? A. Yes.

Q. Do you agree with Dr. Shepard that any figure you may get in nitrogen determinations after your digestion would be within the limits of experimental error?

A. What do you mean, I don't understand that.

Q. Suppose you take an unbleached flour or the gluten made from it, whatever that digested, and the same flour bleached and you made your digestion experiments, then you tried to discover whether one had digested more than the other; I understood Dr. Shepard to say that his figures that he gave were all within the limits of error. Do you agree with that, that the amount is so small you could not possibly distinguish one from the other?

A. I testified to the difference being 50 per cent.

Q. You did not make a nitrogenic determination, did you?

A. No.

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Q. I am talking about nitrogenic determinations?

A. I think that is impossible with a difference of 50 percent in the rate of digestion. I don't see how the nitrogen figures could agree.

Q. I will ask you if it isn't a fact that nitric acid and hydrochloric acid are sometimes given by physicians to aid

digestion? A. Oh, yes.

Q. Take a man, Doctor, who had eaten we will say a quart of food, an ordinary dinner estimated at a quart in volume, how long would you say it would take the normal human being to digest that amount?

A. Honestly, Mr. Elliott I can't answer that question. He might have eaten a quart of lobster, or a quart of

potatoes-

Q. I did not mean a catch question. I have been informed by the books, an ordinary dinner of meat and vegetables—

A. (interrupting) From six to eight hours,

Q. The stomach is supposed to be rid of all of it in seven

hours? A. I would say from six to eight,

Q. Now, as I understand it, you make no distinction between nitrites in their effect or alleged effect on the human economy whether they are taken in by the air, or water or in any food we may eat or if it be the case, in bread made from bleached flour, is that correct?

A. No, I did not make that statement.

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Q. I mean so far as nitrite is concerned, didn't you tell Mr. Butler in your opinion the effect would be the same only it might differ in degree?

True, but then you assume I might breathe it in; in one case swallow it in, the other, if I breathe it in, I know I die of pneumonia.

O. Are nitrites in the air?

A. Not in the free open country, it is only in manufacturing districts and in volcanoes and immediately after or during a thunder storm.

Q. Let us go out in the open, and out in the country, take a bright sunshiny day do you say there is no nitrous acid in the air? A. Not if you do not smoke.

Q. I did not say anything about smoking, I am talking

about the air? A. No, absolutely no trace.

Q. You say there is not a trace of nitrous acid in the air?

A. One can't demonstrate it.

Q. At any rate, that is your statement?

A. Yes, that is my statement.

Q. We will eliminate the breathing now as to taking nitrous acid or nitrites into the human economy by eating them in any way; just assume it is in smoked ham and stale yegetables, if it be the case, and other things, and in the saliva-

I want to include that—would the action of those nitrites be just the same as the action of any nitrites you get from eating bread made from bleached flour?

.1. Exactly the same.

One is harmful and the other is harmful? Q.

Yes, no difference. A.

Now, I understood you to make some statements in answer to Mr. Butler about the effect of over-treatment by this Alsop process; as a matter of fact you never saw this Alsop process operated, did vou? A. No, sir,

By Mr. Butler: My question was the gas employed by the Alsop process.

Q. You never saw the Alsop machine work; you testified to that? A. No, sir.

O. You have no knowledge then of any over-treatment, socalled, by this Alsop process?

A. No, excepting the samples submitted to me by the Government.

Q. You have no knowledge,—I think you stated to Mr. Butler, if you over-treated by the Alsop process you would turn the flour vellow didn't you? A. Yes.

Q. You have no knowledge of any flour having been treated by this Alsop process that was ever turned yellow, do you?

A. Not personally, I have heard about it.

Q. And you have no knowledge as to whether it is possible in any reasonable time to turn flour yellow by that machine?

1. I haven't any doubt, whatsoever but that is done.

Q. Of your own knowledge?

A. I mean, talking as a scientist.Q. But you have no knowledge of it?

A. No, I have no knowledge.

- Q. Now, as to these nitrites in the saliva, do they vary in amount with different individuals? A. Yes, sir.
  - Q. And different times of day?A. Yes, mostly in the morning.

Q. Have you ever made any estimate of the range of variation? A. No, I can't say that I have.

545 Q. Have you ever made any estimate as to the fluctuating amounts—between what limits they would be contained in the saliva?

A. No, I have discussed the matter with Dr. Jones, that

is all.

Q. Can you give me the maximum amount of nitrite you ever found in the mouth? A. No, I could not.

Q. You couldn't give any figure on that?

A. No, I prefer not to.

Q. Can you give any figure of nitrite you found in the saliva, the most that you can think of that you have found?

A. You see—the reason I don't care to answer that question—You see, as soon as I put out my saliva, everything will depend upon the amount of protein cells which were carried to—cells which come from the tongue and from the buccal surface and so on. I don't like to make any statement—If you do not wash your mouth, you have many; if you wash your mouth you have not so many; you have fewer before dinner than after dinner.

O. I understand, you do not care to commit yourself?

A. I might make a statement that I have taken saliva early in the morning and compared it with bleached flour with 1 per million, and I found the saliva gave a stronger reaction than the flour.

Q. Now, have you ever made a quantitive determination of

nitrites in the saliva? A. No, sir, I have not.

Q. But it is within your knowledge, the amount of these nitrites will vary in the saliva in different individuals, and even in the same individuals during the course of the day?

A. Yes, sir.

Q. Now, I just have one question I think I want to ask you about this Exhibit "11". Do I understand that that is intended to represent the difference in the—

A. (Interrupting) The rate-

Q. No, in the appearance of the cell after the plant had this gluten put on it? A. Yes, after it begins to digest.

Q. What did you do, did you take a photograph of that cell,

or how did you do it? A. No, sir.

A. Just what did you do, in plain language?

A. Yes, I am going to give it. I magnified it 1000 546 diameters up to about here, you see this is nearly two

inches, then I put the slide upon the stage of the microscope, and I have on the top of the microscope a special mirror which allows me to see the paper, with my hand on the paper, and I see the image through the microscope and I see my hand at the same time and I draw the outline of this cell, and draw the outline of this then I have a diagram about two inches long. I put this diagram into a projection lantern, and project it against the screen to get a view sufficiently large to be seen at a distance. I do not know the exact magnification; two inches is about 1000 diameters.

Q. I thank you. That is very clear. What I am trying to get at is, did you put the gluten from the bleached flour on this Drosera, this plant and then make those illustrations of

the action, after that?

A. Yes, because I have to take it what we call it, through

the paraffin process.

- Q. It is immaterial to my question how you did it. I simply want to know if that is the difference in the action or appearance of this cell after you put the gluten on this plant?
  - A. Yes.
- Q. I want to ask you if you made a chart of a cell that had the unbleached gluten?
  - A. No, I used this as a standard.

By Mr. Butler: The difference in time, was his comparison according to his direct examination.

Q. Just let me know, did you make a chart of this, similar to this, illustrating the action when you put gluten from the unbleached flour on it?

A. This presents both; this is the maximum change which is it possible to get. (Indicating on Exhibit No. 11.)

Mr. Butler: You might as well not talk at all, unless you indicate what you point to.

The Witness: "C" indicates the maximum change which it is possible to produce. Now, these are individual cells.

## Mr. Elliott:

Q. Now, you say "C" represents what"

A. The maximum change that it is possible to produce in such cell's nucleus after a certain time.

Q. Then, where is the illustration corresponding to "C" that would show the effect of the gluten from un-

bleached flour?

A. Both the bleached and unbleached flour will produce this change; it takes a different length of time. In one case this is 30 hours; the other case here this is 20 hours; that is what I wanted to say. You get the same appearance; there is no difference in the appearance; it is merely a question of time.

Q. That simply illustrates the same appearance?

A. Yes, sir, just a difference in the time.

Q. That illustrates the process of digestion in this plant?

A. A slowing of digestion.

(Witness excused.)

Dr. James H. Shepard, a witness recalled on behalf of the government, testified further as follows:

## Direct Examination

By Mr. Butler:

Q. Some days ago you called my attention to the testimony referred to by Mr. Elliott just now in the cross-examination of Dr. Mann, wherein he expressed his understanding of your answer to the effect that the results of your experiments to determine the digestibility were within experimental error; how did you intend to be understood?

Mr. Elliott: We will have to object to that.

By Mr. Butler: Dr. Shepard has told me he has misspoken himself,—some days ago he asked me to recall him.

By Mr. Scarritt: If he wants to make an explanation; if he wants to take back and swear differently, let him come back, but I object to Mr. Butler speaking for the witness.

By Mr. Butler: It is perfectly proper with a witness of this kind.

The Court: A witness always has the right to make any corrections in his testimony. If there is anything you want to correct, Dr. Shepard?

The Witness: As I recollect, Mr. Elliott was asking me concerning the determination of gains and losses both in amido nitrogen, and in digestion, and as I understood the question, were my results safe that is considering the limits of error. That is, I have found, we will say a gain or loss in digestion, or loss or gain in quantity of amid nitrogen, and I intended to assure Mr. Elliott that my results were good, that they far exceeded experimental error. That is what I meant, and that

my conclusions were safe within the limits of experimental error:

By Mr. Smith: Read that last answer.

(Answer of the witness read by Stenographer)

The Witness: "Outside" the limits.

By Mr. Elliott:

Q. Do you want to change any figures you gave?

A. No, the figures will show for themselves.

(Witness excused)

Morning Session.

Kansas City, Mo., Wednesday, June 8, 1910.

Court [not] pursuant to adjournment and the further hearing of this cause was resumed as follows, to-wit:

Mr. Butler: I intended to ask Dr. Mann a couple of questions that I ought to have him in direct examination. I desire to recall him.

The Court: Very well.

549 A. C. Leflang, called as a witness on the part of libelant, being duly sworn, testified as follows:

## Direct Examination

By Mr. Butler:

Q. What is your name? A. A. C. Leflang.

Q. You are the manager of the mill that milled the flour that was seized in this case? A. Yes, sir.

Q. Mr. Tucker who testified [as] the miller under you?

A. Yes, sir.

Q. When this flour was seized, according to your answer, your mill furnished to Mr. Terry, the purchaser of the seized flour, other flour in its place? A. Yes, sir.

Q. Was that flour so furnished bleached or unbleached?

A. Mr. Terry requested that we send him this time a car of unbleached flour, and we sent it unbleached.

Q. That flour was unbleached? A. Yes, sir.

Q. Was it the same kind of flour as the flour that was seized? A. It was.

Q. And made from the same kind of wheat?

A. To our best knowledge, yes, sir.

By the Court:

Q. By the same processes? A. Yes, sir.

By Mr. Butler:

Q. Milled in the same way?

A. Milled in the same way.

- Q. But it was not subjected to the bleaching?
- A. Yes, sir.

By the Court:

Q. Yes, or no. A. Yes,-no, it was not.

Q. Not bleached? A. Not bleached.

By Mr. Butler:

Q. I call your attention to a sack of flour—a sack containing some flour, it has been opened, which is marked Government's Exhibit 12, and ask you if the flour which you sent to Mr. Terry in place of the flour that was seized, was put up in sacks of the kind marked Exhibit 12? A. Yes, sir.

The Court: Terry is the grocer down at Green Castle.

By Mr. Butler:

Q. And the flour was branded in a different way, was it

not? A. Yes, sir.

550 Q. The flour which was not bleached and which was sent to Mr. Terry was branded "Purity, hard wheat finish patent," also it says "Highest Patent" on it, and Lexington Mill & Elevator Company?

A. Yes, sir.

Q. Lexington, Nebraska, and contained twenty-four pound sacks, were they all twenty-four pound sacks? A. No.

Q. Some of each size, some twenty-four?

A. Most of it, I think, was forty-eight; I don't remember shipping any twenty-fours to him, we possibly did.

Q. (By Mr. Smith) What was that answer?

- A. I say it was practically all in forty-eights, there may have been a few twenty-fours, sacks. I have no record of that.
- Q. And all of the flour that was seized was put up and labeled and branded as this sack marked Government's Exhibit 13? A. It was.

Q. That is all.

Mr. Smith: No cross-examination.

B. C. Winslow, called as a witness on the part of the libelant, being duly sworn, testified as follows:

### Direct Examination

By Mr. Butler:

Q. Mr. Winslow, your initials are? A. B. C.

Q. And you are one of the inspectors in the Bureau of Chemistry of the Department of Agriculture? A. I am.

Q. Did you at the request of the United States marshal and in conformity with the order of court go to Castle in Missouri and bring here some of the flour that was seized?

A. I did.

Q. You left last Saturday and returned yesterday?

A. Sunday morning.

Q. Returned Monday?

A. Returned Monday night.

Q. You brought how many sacks of that seizure?

A. Two sacks, two forty-eight pound sacks?

- Q. Is this Government's Exhibit 13 one of them.
- 551 Q. Did you also bring from Mr. Terry the sack of flour which is here marked Government's Exhibit 12?

A. I did.

Q. Since the sacks were brought here some flour has been taken out of each in the laboratory in this building, the Government Building?

A. Out of the "Purity", but not of the other sack.

Q. The other sack has not been opened, is that it?

A. That is true.

Q. The "Purity" is Government's Exhibit 12. That will be all.

#### Cross-Examination

By Mr. Smith:

Q. One question, when you went to Castle where did you get the sack, forty-eight pound sack? A. XXXXX Cream.

Q. Yes, sir.

A. From B. O. Terry who has this flour in his custody up there.

Q. I see. Well, did you open it before you brought it?

A. No, sir,

Q. Did you open any of the sacks down there?

A. No, sir.

Q. Did you examine any of the other sacks that were there?

A. From the outside I did.

Q Well, what examination did you make outside?

A. I looked over the sacks in the room, it was all in proper shape, that is it was being properly cared for.

Q. And did you make any examination of any flours there.

A. I did not.

Q. Or taste any of them. A. Not there.

Q. Well, I mean speaking of what you did at Castle?

A. No, I did not.

Q. You did not examine any of the flour or any sacks or obtain any of them? A. I did not.

Q. Just took out one of the sacks and brought it?

A. Yes, sir.

Q. Sir? A. Two of them.

Q. Took out two of the sacks and brought them?

A. Yes, sir.

Q. Without making any examination of all of them there?
A. Correct.

552 Q. Then the small sack you got from Mr. Terry's store?
A. I did.

## Redirect Examination

By Mr. Butler:

Q. Just a question. Of this flour that was seized, did you since the adjournment of court last night, deliver some [ot] it to Professor Mann of the other bag, this bag you told me was not opened? A. I did.

Q. You did out of the other bag that was brought from

there, the very flour that was seized?

A. The same thing.

Q. And some of this "Purity" out of this sack that is here in court? A. Yes, sir.

Dr. Gustave Mann, recalled as a witness on the part of libelant, further testified as follows:

#### Cross-Examination

By Mr. Elliott:

Q. I would like to ask you, Doctor, in these digestion experiments where you, as understand it, cut the tubes in two, the glass tubes sawed the glass tubes off with gluten in it?

A. Yes, sir.

Q. Did you weigh each one of these tubes?

A. No, that is immaterial whether the tube is one inch longer or whether the tube is ten inches.

Q. You say that would be immaterial.

A. Absolutely immaterial.

Q. Now, the impairment of digestibility you speak of refers to flours and to gluten which you extracted from flours, does it not? A. Yes, sir.

Q. Why didn't you test, may I ask you, the relative digestibility of bread made from bleached and unbleached flours?

A. Well, I don't quite understand.

Q. I say your digestion work referred only to flour and to gluten extracted from the flour? A. Yes, sir.

Q. Didn't refer to the bread? A. Yes, sir.

Q. It did? A. Yes, sir.

Q. Oh, you made a digestion of bread?

A. No. sir, I did not.

Q. Now, I ask you why didn't you determine the relative digestibility of the bread made from these flours?

A. Because the thing which is of real importance to us in the bread is the gluten. Q. Now, no one eats raw gluten, do they?

A. No, sir, that is the reason I cooked it before I tried my test.

Q. And gluten separated from starch is practically indigestible, isn't it? A. Oh, not at all.

Q. You think not?

A. Not at all, sir, oh no, I have got some proofs of that.

Q. Now, I wish you would describe in detail the method including apparatus you used in preparing nitrogen peroxide for

bleaching this flour.

A. Well, I have in my laboratory a certain stand about this high (indicating) and in that stand are three inverted bottles, and these three bottles are connected with one another. Now, in connection with these three bottles I have got a vessel about this high (indicating) so as to be able to regulate the amount of pressure in these different bottles of the gas which I liberate. Now, when I liberate my gas I get from it the action of nitric acid on starch, that is the chief method which I use, and then this gas which I get in this way liberated consisting of fumes, I then led through water so as to combine any free nitric acid which might be there, and then wash it in this way. I put it into a bottle, and having put it into the bottle. I got there a certain amount of pressure, atmospheric pressure, and then from this bottle I take in one case, say two or four, six, as the case may be, cubic centimeters, and added with each cubic centimeter 2.056 grams by weight,

the cubic centimeter is equal to two milligrams, and therefore half a cubic centimeter is equal to one milligram per kilo weight of flour.

Q. Now, just let me get that once more. First you put the nitric acid on starch, as I understand? A. Yes, sir.

Q. And generate a gas? A. Yes.

Q. Now, you conduct that gas through water?

A. Yes, sir.

Q. And I believe we have had it testified here that then you would have this nitrous acid and nitric acid in the water, would you not? A. Yes, sir.

Q. Now, then, what did you do?

A. Well, the gas after it passed through the water is washed; that means the water can only hold a certain amount of the gas in solution, and the rest of the gas remains gas and passes through.

Q. Goes on over? A. Goes on over.

Q. Into this large bottle you speak of?

A. Yes, sir, you see those three bottles they are all connected up with one another, and when I start generating the gas in the first bottle, that gradually displaces the air, and will go in the second bottle and from the second bottle into

the third bottle, and if I let the stream run long I displace all the air; but this is only one way. May I add the other way in which I did it.

Q. Yes, sir.

A. That is the one way I did it, and the other way in which I did it was to take equal amounts of nitrite, such as sodium nitrite, and an equivalent amount in some cases, of a strong acid, such as hydrochloric acid, in other cases of a weak acid such as acetic acid, that means just enough of hydrochlorid, one part of hydrochlorid to be displaced practically by one molecule of soda nitrite; so I get one molecule of soda nitrite and one molecule of nitrous acid; and this is the method which I adopted in all my very extensive bleaching.

Q. Now, how many times—first let me ask you, these are, I presume well known laboratory methods, are they, for generat-

ing peroxide of nitrogen? A. Yes, sir I think so.

Q. How many times did you try the experiment of washing out the gluten from both bleached and unbleached flour?

A. I don't know whether you mean how often I did it each time I did it, or how often I did it altogether?

). No, how often did you do it?

A. Well, at least fifty or sixty times, I mean taking it altogether, not counting the—let me see—oh, it must be more than that; it must be more than that.

Q. Then for the purpose of any particular experiment how

often did vou do it?

A. Well, from six to ten times; sometimes I did it six times; sometimes I did it ten times, because a great deal depends on the ease with which the starch will pass from different flours; I don't know why it should be, but sometimes the starch seems to adhere a great deal more firmly to the gluten than it does at other times, but never less than six times.

Q. How did you apply one part per million of nitrogen

peroxide to the flour; how did you determine that?

A. Well, I took a kilo of flour, and I took half a cubic centimeter of the gas and atmospheric pressure.

Q. That would give you-

A. That would give me one per million of NO2.

Q. I am very much obliged to you, Doctor; they were just some details these gentlemen wanted to have, that is all.

## Redirect Examination

By Mr. Butler:

Q. Referring to the experiments, the flour with which you experimented, the "Golden Drop" flour; you told us that you took some of it and bleached it by two and a half parts of nitrogen peroxide gas per million parts? A. Yes, sir.

Q. And then tested its digestibility, the digestibility of the gluten from it with the digestibility of the gluten from the unbleached and that that was done a couple of days, as I recall your testimony, after the bleaching? A. Yes, sir.

Q. Now, did you again on the same flour, after the lapse of some weeks, test the digestibility of the bleached

flour and unbleached flour?

A. As near as I can recollect—I have not got the notes here
—I repeated the experiment about one month later, and about
seven weeks later.

Q. Yes, Now, the experiment that you repeated one month after the bleaching, what did you find—more digestibility?

A. I found taking the time of digestion as a factor, that the digestion of the bleached flour took longer; or put it differently, the same amount which was digested in the first instance, in a given time, would require more time the second time.

Q. Yes, sir, that is it had grown more indigestible as time

went on.

A. It had grown more indigestible as time went on.

Q. That is the bleached flour?

A. That is the bleached flour.

Q. Now, at a later period, seven or eight weeks?

A. The difference was still more marked.
Q. The difference was still more marked?

A. After I made it, I did this experiment because I could not understand what Halliburton in his testimony said, that different samples of flour, bleached to the same extent, giving different reactions; that is the reason I made that experiment.

Q. Now, since the court adjourned last night have you undertaken any test of the digestibility of gluten found in the flour seized which Mr. Winslow testified that he gave you in one of the sacks that he just brought up from the place of storage, as compared with this flour known as "Purity" flour which he also gave you? A. Yes, sir.

Q. And at the adjournment of court you set such a test going, did you? A. Yes, sir, and I worked all night at it.

Q. Yes, worked all night, and have you the thing there?

A. I brought the bottle down just out of the incubator.

Q. Is this it? A. Yes, sir.

Q. Now, will you tell the jury which is digesting faster?

A. In this bottle there are two tubes, and one tube has a string around it, and that tube which has the string

it is the bleached flour, and the one which has not the string around it is the unbleached flour and they are both held up here by these two threads; the per cent of pepsin solution which I used, I have to use a very strong solution because the time was very short. I took five grams of the scale pepsin,

five grams of scale pepsin; I took in 300 c. c. 300 cubic centimeters of water; I added to the 300 cubic centimeters of water 38 drops of pure hydro-chloric acid; then I put these tube tests into the incubator at a temperature of between 39 and 40 degrees Centigrade, and left it there till this morning, when I overslept myself, I am sorry to say, and brought it down.

Q. And you say there is a difference?

A. I should say of fifty per cent. Q. Which is digesting the faster?

A. The unbleached is digesting the faster.

Q. And there is a difference in the rate of digestion of about fifty per cent, you say?

A. I should say so; I leave it to Mr. Elliott; they have both got strings so as to keep the tubes suspended from the top.

### By Mr. Elliott:

Q. Which do you say is the bleached?

A. Here you see this here is the bleached with the string around it, and the unbleached is that one. I made the gluten, I dried the amount of water in it, but I have not been able to weigh it, having overslept myself.

Q. Did you treat both the flour that was seized and this package flour sent by the miller in substitution of the flour

seized, and are these experiments exactly alike?

A. Absolutely. I had them in two basins, I squeezed them the same length of time, and washed them in hydrant water the same length of time and in distilled water the same length; I may say after I could get all the gluten I could in every case, why, then, I weighed them; when I weighed them I found that the amount of gluten which I got from the bleached flour was heavier than the amount of gluten I got

from the other; so I weighed out certain portions and let them dry all night, but I don't have their weight.

Q. Did you take the same amount of flour?

A. Absolutely.

Q. And the same amount of gluten out of the bleached flour?

A. Well, I would not put it that way, I said the gluten weighed more.

Q. Oh, yes.

A. It may have taken up more water, you see, but I don't know whether—

Q. It was not as dry?

A. No, I simply took every possible precaution, I found when I weighed the two together that the flour from the bleached weighed more.

#### Redirect Examination.

By Mr. Elliott:

Q. Doctor, I would like to ask you if, in your judgment,

there isn't some starch in that gluten?

A. Well, if there is starch, according to my way of having prepared it, Mr.Elliott, I should say there is as much starch to my mind as in the other; I went about it deliberately, squeezing it, till eleven o'clock last night, getting as much of the starch out of it as possible.

Q. I haven't the slightest doubt but what you did the best

you could.

A. At best there is a certain amount of starch, you see it would take over a day to take all the starch out, and I could not [possible] do it.

Q. I am simply seeking to get some details, that is all.

A. Yes, sir.

Q. Would it be, in your judgment, as high as fifteen per cent of starch? A. I doubt it.

Q. You doubt it? A. I doubt it.

Q. At any rate you did not determine the starch?

A. No, I did not determine the starch.

Q. You did not determine the starch? A. No, sir.

Q. Then the moisture, I understand you, you did not determine, is that correct?

559 A. Well, I squeezed it as much as I could; I have not determined it, but the measurements are upstairs, and if you like I could go and measure them.

Q. No, but you did not determine if the measure contained in each gluten was the same. I do not quite understand your

explanation.

A. What I did, Mr. Elliott, is, I took the same weight of the bleached and the same weight of the unbleached gluten after I had prepared it, and put it into the tube, and there is still a great deal upstairs; I took that, put it onto a carefully weighed piece of filter paper, a piece of paper about that size, and spread it out, and wrote on it U. and B., that is unbleached and bleached, and I put it on a hot stove to dry all night, with the view of testing the actual amount of water which had been in these two samples this morning by weight, but I'm sorry I could not do it.

Q. That is the extent of your experiment?

A. Yes, sir, that is the extent of my experiment.

Q. Just one other question, if it should chance that there was a different starch in this, that is, if one had more or less starch than the other, or one had more or less moisture than the other, that might make some difference in the rate of digestion? A. Yes, sir, might make some difference.

Q. That is all sir.

By Mr. Butler:

Q. They were, however, treated as nearly alike as you were able to do? A. Well, I did my best; I could not do more.

Samuel Thruston Ballard, called as a witness on the part of the libelant, being duly sworn, testified as follows:

### Direct Examination

By Mr. Butler:

560 Q. Mr. Ballard, what is your first name?

A. My full name is Samuel Thruston Ballard.

Q. And where do you live? A. Louisville, Kentucky.

Q. What is your occupation?

A. In the milling business, flour mill.

Q. What concern are you connected with?

A. Ballard & Ballard Company, Louisville, Kentucky.

Q. Is it a partnership?

A. No, a corporation, but my brother and I own between us all the stock, each of us owning half.

Q. How long have you been in the milling business?

A. I went into the milling business in the summer of 1880 -thirty years ago.

Q. And have you been engaged in the milling business ever since? A. Ever since.

Q. At Louisville? A. Louisville, Kentucky, yes, sir.

Q. What size mill have you?

A. We have a flour mill that makes under ordinary conditions twenty-five hundred barrels a day; we have sometimes, if trade conditions are such that we have a demand for more flour, we have run as high as thirty-five hundred and thirty-six hundred barrels of flour a day.

Q. Do you belong to the Millers' Association-organiza-

tion?

A. Yes, sir, we belonged primarily to what we call is the Southeast Millers' Association, which is the millers along the Ohio river, and south east of the Ohio river; and we belong to the Ohio Millers' Association, and we belong to the General National Millers' Association, Millers' National Federation, I think it is called.

Q. Have you visited other mills?

A. Yes, sir, I visited a great many mills in my life.

Q. Where?

A. Well, the mill that I have gone to perhaps more is a mill at Seymour, Indiana, which is about sixty miles from Louisville; I visited the mills in Nashville, in Chattanooga, and in Knoxville and St. Louis; I was out here five or six years ago to a millers' banquet, and I went through some mills here. I have been through some of the mills in Min-

neapolis. Two weeks ago I was in a mill in Toledo, the 561 next morning after and in Fostoria, the Harder Milling Company; and the truth is I love to go in mills and wherever I go, I am fond of the millers, that is, we are good friends and I take a great pleasure in going through the flour mills wherever I am, and without aiming to pry into their business I nearly always see something that I think is a benefit to us or something that we can adopt, and I very frankly say to the miller, "This is a good point," and he says "You can adopt that."

Counsel for claimant objected.

The Court: I don't see any point to this.

Witness: I am merely saying I like to go into mills.

Q. Have you become familiar with millers, millers generally?

A. Yes, sir; I am pretty familiar with the millers of a great many mills.

Q. Over the whole country?

A. Over the country generally.

Q. And with principles of treating flour and bleaching flour after the milling process has been completed?

A. Well, I am very familiar, of course, with the Alsop

also.

Q. How long have you been familiar with the Alsop process?

A. We were one of the first mills to adopt the Alsop process, and I think that was in 1904 that we adopted that process.

Q. Are you a stockholder in the Alsop Bleacher Company?

A. Yes, sir, our firm is a stockholder, I think it is the American Milling and Purifying Company, it is called, since consolidated with Alsop.

Q. What other processes have you also observed for bleach-

ing flour?

A. Well, I have seen the so-called Williams process in operation; I have seen a process that Dr. Wisner invented or developed.

Q. What is the name of that?

A. I forget the name of it, what it is called.

Q. Nitrocele chloride? A. Nitrocele chloride.

562 Mr. Butler: Chloride or chlorine?

Judge Helm: Chloride.

Witness: Then I saw a mill at Nashville that tested a bleaching apparatus that Nordyke and Marmon were experimenting with, and I don't know what that was, an agitator was shipped to them in a large jug, a kind of a carboy, but I always thought that was sulphuric acid, but I don't know as to that, and I also experimented with fumes of the sulphur candle.

Counsel for claimant objected as not having anything to do with this case.

Mr. Butler: Well, I think it is very important or may become so, to consider the effect of NO2 upon flour, whether it is made by nitrocele chloride or whether it is made by sticking an electrode in nitric acid, or it is made by feeding a soft iron wire into nitric acid if the fumes of NO2 are brought into contact with the flour, and some witnesses to come in this case have used the fumes made one way and some witnesses have used the fumes made another way.

Mr. Elliott: I don't remember any testimony to that effect and we will deal with these matters when we come to them. What I am objecting to is this witness' discursive remark about various things. He says he thinks it was sulphuric acid, or something of that sort. That does not enlighten the—

The Court: But, Mr. Elliott, I pressed you yesterday, and did not get an answer as to whether or not there is any difference as to the method of manufacturing NO2 or hydrogen peroxide or nitrous acid or nitric acid or nitrates or nitrites, and for reasons quite satisfactory to yourself you did not tell me whether you were going to combat that or not; so that not being a chemist, but having some general notions about it, I will have to let this evidence go on until you let us see what issue you are going to tender.

that because my associates called it to my mind. I really didn't understand Your Honor's question. If you mean as to peroxide of nitrogen, whether it is any different in the Alsop process from what it is in that generated commercially, we say so far as there may be peroxide of nitrogen in this air that is treated by the electric arc, it would be just the same as peroxide of nitrogen generated in any other way. Peroxide of nitrogen is the same however generated.

The Court: You don't intend to combat that?

Mr. Elliott: Not at all. What we say is, however, that there is a difference between this air modified by the electric arc containing a [more] trace of peroxide of nitrogen, and concentrated peroxide of nitrogen such as these gentlemen used. I did not catch the force of your Honor's question or I should have answered it earlier.

Mr. Butler: It will save me a world of trouble if it be conceded, Mr. Elliott, that the nitrogen peroxide is the bleaching method employed by certain other processes. I won't name them unless you express your willingness to concede it.

Mr. Elliott: Well, I cannot do that.

Mr. Butler: Can't you with respect to the Williams?

Mr. Elliott: I certainly cannot, I don't know.

Mr. Butler: The Naylor and Girard.

Mr. Elliott: The Naylor and Girard, of course we contend that-

Mr. Butler: You sued them and said then that you were the only people entitled to use that re-agent.

Mr. Elliott: But I mean as to the Williams process.

Mr. Butler: It is a peroxide of nitrogen?

Mr. Elliott: I contend it is, but I would not object to conceding it if I knew its composition, that's all, I mean I couldn't say. I am not a chemist.

564 The Court: We will simply have to go on and see what their chemists say about these things. I have my notion about it.

Judge Scarritt: If Your Honor please, what difference would it make if we are not showing any of these other methods. Now, I don't know anything about them, but I know enough about evidence in a lawsuit to know that we must stick to the issues laid down by the pleadings.

The Court: That is the A B C of the law. Please don't take up my time with that.

Judge Scarritt: I am not taking up your time on that, I am simply suggesting that to give us a basis for the admission of testimony in this case. Now, the issue in this case on this point is as to whether this flour has been adulterated by the use of the Alsop process. Now, if flour has been adulterated by the use of some other process it does not tend to prove that it was adulterated by the use of this process, and we are getting out into fields of conjecture and discussion that do not do us any good.

The Court: Precisely, and why now—I am not criticising anyone, though, but these cross-examination, somewhat lengthily, of which I am making no complaint, have been along the line that [possible] these chemists are wholly mistak-

en because flour was bleached in the laboratory with nitrogen peroxide generated in a way other and different from what it was generated by the Alsop process, thereby meaning that they are going to tender-that you gentlemen are going to tender an issue on that.

Judge Scarritt: Why, certainly, we are going to show that these fellows don't know anything about what they are talking about, if we can.

The Court: And these chemists say that your people don't know what they are talking about.

Judge Scarritt: That is all right.

The Court: Now, then, that is the pot and the kettle 565 calling each other black.

Judge Scarritt: Why don't you ask Mr. Butler whether it is true or not?

Mr. Butler: I will answer it.

The Court: You people are denying that nitrogen peroxide as generated by the Alsop process is a different thing than what it is if generated in the laboratory?

Judge Scarritt: Oh, no.

The Court: Just a moment. I have got my opinion about that, but let's wait and see what your chemists say about it.

Judge Scarritt: Let's wait and see what the jury will do about that, and it is not for us or your Honor to decide. It is a matter-that is a fact for the jury to decide under your Honor's instructions, and it is a matter for us to submit to the jury.

The Court: The objection is overruled.

Judge Scarritt: We save an exception.

By Mr. Butler resuming:

Q. Have you been in mills employing other processes than the Alsop process for bleaching? A. Yes, sir.

Q. What processes?

Well, I have seen the Williams process, and, as I told you, I have myself experimented with this nitrocele, Dr. Wisner's gas, and I was in a mill in Nashville where they experimented with this bottle that came there, of course I don't know what that is.

Judge Scarritt: We object to that and ask that the answer of the witness be stricken out for the reasons heretofore stated. The court overruled the objection; to which ruling of the court claimant then and there at the time duly excepted.

Q. Now, how long did you employ the Alsop process in your mill, Mr. Ballard?

A. We began somewhere about perhaps 1904, the lat-566 ter part of the year, and used it until the Pure Food Commission ruled against it, and I think we stopped the last day of March, 1909, that is a year ago last March.

Q. So then that was about three or four years?

A. We used it from three to four years, I should think.

Q. On all your flour? A. On practically all of our flour.

Judge Scarritt: Now, if your Honor please, I object to the testimony of the witness wherein he said some state food commission ruled against it.

Mr. Butler: That is the Government.

Witness: I said the Pure Food Commission in Washington.

The Court: Yes, it is not proper what anyone said about that.

Witness: Well, we used it until the Government ordered it stopped, Judge.

Judge Scarritt: I object to that and move it be stricken out.

The Court: Let it go out.

By Mr. Butler, resuming:

Q. You stopped in March?

A. We stopped last March a year ago.
 Q. Are you yourself a practical miller?

A. Yes, sir, I am a practical miller.

Q. And were you familiar with the manner of the use of the Alsop process as it was used in your mill?

A. Yes, sir, perfectly.

Q. You may describe how you used it there.

A. Will I describe the process for making the gas also.

Q. Yes, sir.

A. Our machines were really the old-style machines as made by the Alsop Company, among the first that were sent out. They consisted primarily of a cylinder about this long, about two feet long, and about four inches in diameter, two cylinders in a machine and in each of those cylinders they have a moving rod up and down, through which electricity is passed, and then there is a pump that pumps air through those

two cylinders, something like this, and as those two rods are pulled apart by a mechanism, the electricity is turned on, and as they pull apart, a very powerful electric current, a very strong, powerful flame is generated, and it seems like a flame, and the air being pumped through that cylinder where this flame and discharge of electricity is, seems to in some way change the quality of that air, makes it whatever it is, we always speak of it as the gas or that gas.

O. And you say that got into the flour?

That was pumped through this, and then went through a pipe,-we had in our mill, we had four of these separate machines; we had land shafting, and each machine was driven by a belt and separate pulley, and each pulley had what we call a friction clutch, so we could run one machine, two machines, three machines or all four of them. Our practice was to run three machines ordinarily. We had more than we needed, so in case some machine would get out of commission or something would happen to it, like a machine would be shut down, we could put in another one; in that way we could maintain, if possible the uniform quality of our gas. The electrified air or the gas passed through this, about a four-inch pipe, up into the mill, and we bought from the Alsop Company, or their successors, machines known as agitators, that is a machine about eight or ten feet long, and probably two feet in diameter, and the flour is admitted in the top at one end, and passes out at the bottom at the other end; that agitator is shoved toward the center; it revolves, and has beaters like your hand that was intended to throw the flour up into the air and arrange it so that it could all come in contact with this gas and then pass out bleached.

Q. Did these agitators have a name?

A. No, they were called agitators. Then from there it passed through a spout and went in the conveyer carrying the flour to our packers. Our mill is rather a large mill, and it has grown from a very small one, and we had difficulty in placing these agitators, so we had to have ten; we put them in different parts of the mill and sometimes flour would drop from this agitator to the spout to carry to the conveyer

back up to the packer, sometimes we had to have it repaired, but that was merely a detail of our mechanical location; it did not, as far as I know, effect the flour at all. We made a great many improvements on this, because, for instance, we wanted to get better results, naturally, from time to time; we sometimes felt we were not getting as good results as our neighbor, and we put up a drum, a large drum, four or five feet in diameter, and about ten or twelve feet high in a little area between our engine room where we had these electrifiers and our agitators, which we put in the mill, and then we allowed the gas to go through that drum and on through the pipes to the various agitators.

The Court: Just a moment. Some witness on the stand said the other day, I didn't understand exactly, that practically half way between the cylinder, that flaming arc and the agitator—what office does that drum fill?

A. Judge, it naturally fills this point, for instance, we had

there our electrifiers, we will say-

## By the Court:

Q. Oh, no, I don't want that; get down to the point.

A. Well, the point is this, that from the electrifiers to the agitators—

#### By the Court:

Q. About thirty feet in some gentleman's mill?

A. Well, in our mili it is probably one hundred, or some place along there, and it was deemed that the amount of gas going through there didn't have time to get itself in a capable state, or such a state that it would have the best effect on flour.

### By the Court:

Q. A kind of storage drum?

A. It was a storage drum, it took that much longer.

## By the Court:

Q. That is enough.

A. And we experimented with that, and then we put on three other drums, each of which is about two feet in diameter about five feet high, and this gas part of the treatment of the flour is in some way affected by the weather, how I don't know, whether by damp weather, or dry weather, or cold weather or warm weather, and we would experiment, if the miller

found that he was not getting the proper treatment of his flour, he would begin to experiment; we sometimes ran the flour through all four of these drums, some-

times but three of them.

Q. What do you mean running the flour?

A. I mean the gas through the flour drums, before going to the flour; sometimes it would go through three, sometimes we would cut out one and cut in another, and he would experiment repeatedly to get what he considered the best results. That is a mere detail of the mill.

Q. Now did you employ these agitators all of the time that you used the process for the purpose of mixing the gas

with the flour?

A. Towards the latter part of our experience I did not feel that the agitators were necessary; I felt that the flour, the gas could go into a conveyor—

Judge Scarritt: I object to what he felt, if your Honor please.

The Court: Yes.

Q. It didn't really make any difference one way or the other, we took them out.

Judge Scarritt: I am not talking to the witness; I am talking to the court.

The Court: Mr. Witness, please just answer the questions as briefly as you can, and then wait for the next question.

A. We took the agitators out.

By Mr. Butler:

Then after that how did you apply the gas?

Judge Scarritt: I object to that, because the process, as shown by the patent, called for the agitators, and to take this process after the agitators were out, so it makes no difference what was done.

The Court: I don't know about that. You may answer.

To which ruling of the court claimant then and there duly excepted.

A. Well, we just turned the pipes into the conveyor and let the conveyor act as an agitator, and we didn't see any difference in the results; that is all.

Q. Now sometimes you applied the gas by means of the agitator, and sometimes by turning it into the conveyor. 570 was there any difference turning it into the conveyor, observable in the effect of the gas upon the flour?

A. I didn't see any difference.

Now as respects the character of this gas, did it have an odor? A. Yes, it had an odor.

Q. And can you describe, was that a characteristic such

as you would recognize?

Yes, when you go into the mill any part near where the agitators were or where the flour was being treated, or in the packing room where the flour was being packed, you could smell this pungent gas and it was readily recognizable.

Smell it in the flour as it went through the conveyors?

A. I never smelled it in the flour, never tried it.

Where would you smell it?

Well, we would smell it in the mill near where the agitators was where it was going into the conveyors you could smell it in the packing room where the flour was being packed and along the line of the conveyor to the packing room.

Did you observe the difference in flour before and after

the treatment? A. Yes, sir.

Q. And at different degrees of treatment? A. Yes, sir.

Q. You may explain what you observed in that regard?

A. In our mill practically we bleach to a certain extent, and the flour was whiter by this bleaching, we had a spout that came to a certain table where we were in the habit of examining flour; that had a valve and shut it off, and that spout was where the gas would come through and sometimes, in fact any time we wanted to, examine to see whether our flour was bleached as much as it could be bleached, or what effect more bleaching would have, we would slick down on a board some flour, either bleached or unbleached, and put it under that spout and open the valve and allow the gas to come directly on to the slick plane that flour that had been flattened on the board.

Q. That would be the gas [our] of the conveyor?

A. No, out of the spout that went to the agitator.

Q. Yes, sir, that is after it had passed the drum?

A. After it passed these drums, and in our mill we 571 never failed to find that the gas would continuously bleach the flour or bleach it more than we were in the habit of bleaching it.

Q. Now did you observe any flour that had been delayed in passage through the conveyors or the agitators or spouts or any place and subjected to this Alsop gas for a longer time

than flour was usually subjected to it?

A. Yes, sir, in the agitators and in the spouts and in the conveyors wherever the flour would lie for sometime it would become yellow and more and more yellow until it would assume a color of a dark red orange.

Q. To what extent did you smell that; did you smell of

that flour? A. No, I didn't smell it.

Q. Now to what extent did you observe that and what did

you do about it, if anything?

A. Well, when I saw it, I instructed the miller that he must be very careful and every Monday morning we went over one Monday half the mill, and the other Monday the other half, and scraped off these parts, to avoid any possibility of the flour bleaching so that it should become overtreated in this manner, and we scraped that flour away and threw it on the dump.

Q. How often?

- A. Every two weeks we scraped off these parts, one week half the mill, and the other week the other half.
- Q. What kind of pipe did you use to conduct the gas from the gas machine to the flour?
- A. At first we used, from these drums we used a galvanized iron piping about four inches in diameter, and as we would

take off branches to different agitators, they were usually two inches in diameter, and that was galvanized iron.

Q. Did you observe what effect, if any, the gas had upon the iron pipes and other substances with which it came in contact while you were employing it to bleach your flour?

A. Whenever we would be running it for some time we found that our pumps were not positive, and we put in what we call a positive pump, so that the air should go through these electrifiers uniformly and continuously and go to the agitators uniformly and continuously, and in putting in that

pump, we put it in the middle, and were compelled to take down some of these pipes, and in taking down the

agitators and changing and deciding to put the bleaching in another part of the mill in these conveyors, we took down these pipes, and I just told the men to put the pipes back to the new part, and they called me over to the mill one morning and said, "Mr. Ballard, look at these pipes."

Judge Scarritt: We object to that,

Q. Well, you saw the pipes?

A. I did look at the pipes and they were all eaten up and rotted out, and would just open up in your hands.

Q. How long had they been used conducting this gas?

A. I say about two years.

Q. And they were about two inches in diameter, some were four and some were two, and they were galvanized iron?

A. Galvanized iron.

Q. Do you know the thickness of that?

A. No, I don't know the grade.

Q. Did you observe whether or not there was any sediment inside, or accumulations, perhaps is a better word than sediment?

A. Yes, sir, there was at various parts in the bends of the pipes and in the electrifiers and up in the pipes after you pass these drums, we found quite little collections of material, looked about like iron filings, kind of reddish color, and I just suppose it was iron filings or something of that kind.

Q. Did you make different kinds of flour there, as patent,

clear and the like?

A. Yes, when we quit bleaching we were making then two grades of flour, an eighty-five per cent flour and a fifteen per cent low grade.

Q. When you commenced how was it?

A. Well I don't very well remember, when we commenced that was several years ago, we made a number of experiments and what we were doing when we commenced I really forget, but we calculated we were making 85 per cent of a high grade flour, and now we are making fifty-five per cent.

Q. Now, as to the color of the patent flour compared with the clear unbleached.

A. We make three grades of flour now; our patent 55 per cent, and what we call our clear 35 per cent, and low grade
10 per cent. The patent flour is whiter and clearer
573 than the clear flour, and the clear flour is whiter than

the low grade.

By Mr. Elliott:

Q. How much of a percentage do you make clear?

A. 35 per cent, 55 patent, 10 per cent a low grade and 35 per cent clear. Of course you know that the per cent, they may vary one per cent; that is about what we are doing now.

By Mr. Butler, resuming:

Q. Now, as to the effect of bleaching by this Alsop process

upon the color of these flours.

A. Our patent flour, as I say, is whiter than our clear flour, but we can bleach the clear flour in the ordinary commercial way and it will be whiter than our patent.

2. And does the amount of bleaching or whitening depend

upon the amount of pressure by the gas?

A. Yes, sir, it does.

Q. The more gas the whiter?

A. The more gas the whiter it is until it gets a purpleish,

lavender color after a while.

Q. Now, have you observed the relative keeping qualities of the flour, that is the same flour, bleached and unbleached?

A. Yes, sir.

Q. What is the effect in that regard?

A. So far as color is concerned the bleached flour seems to go on bleaching, and after a while, after a month or two months, it gets a lavender or purplish hue, and gets what we call a sickly hue, and it gets that more and more the longer you wait; but with regard to the keeping quality of bleached and unbleached flour, in another regard, that is with regard to must, flour is liable to get musty if stored, and particularly stored in not a very dry place, and the bleached flour is less liable to get musty than unbleached flour.

Q. Did you ever make any comparison of bread made from the same flour, one being bleached by the Alsop process, and

the other being unbleached?

A. Yes, I heard the question raised as to whether or not the chemical—whatever it was which is in the flour, was dissipated and passed off in the making of bread; and I made some experiments by making bread of unbleached flour, and

making bread of the same flour bleached, and I found 574 that when we would cut them into hunks and put them into the glass jar, and set that aside for a day or two or three, that the mold—whatever the mold is I don't know—the mold would come on the bread made from unbleached flour sooner than it would come on the bread made from bleached flour.

Q. And the bleached flour used for this purpose, this was bleached in the ordinary way?

A. One before going through the bleacher and the other afterwards.

Q. And just in the same degree that you were accustomed to use? A. The regular commercial method.

Q. And was there much difference in time requiring the de-

velopment of mold?

- A. Ordinarily I should say that mold on the bread would appear on the unbleached bread, made from unbleached flour, perhaps in two days, depending a little on the water and the conditions; and on the bleached flour it usually took from one to two days longer, I mean on the bread made from bleached flour it would take from one to two days longer before the mold would appear.
- Q. Now, as to the kinds of flour that you bleached: did you bleach any part of the patent?

A. We bleached all of our flours of three grades.

Q. That is, a patent, clear and low grade? A. Low grade.

Q. And the effect upon the color of each compared with the color of the others of each grade, compared with the color of the others, what was that?

A. Well, I can bleach the clear and make it as white as the patent; I don't think that the ordinary mill can bleach the low grade and make it as white as the flour, low grades don't yield to bleaching so readily as other grades.

Q. Now, if the same degree of bleaching be applied to the different grades, that is, the patent and the clear and the low grades, I mean the same amount of treatment or gas be applied, what will be the relation of the colors afterwards?

A. Well, the patent is whiter than the clear; the patent will remain whiter than the clear, and the clear will remain whiter than the low grade, and the bleaching does not affect

that relative position particularly. If the patent remains unbleached, and the clear is bleached, the clear will be whiter than the patent unbleached.

Q. Now, in case the patent be bleached relatively lightly, the clear heavier, and the low grade still heavier, then the re-

lation of color of each to the others?

A. Well, if the patent, of course, is bleached lightly, and the clear heavily, I should say that you could get to the point that you could make the clear and the patent practically the same, but you can never bleach a low grade to make it look like a patent. Q. Why?

A. Because the fiber and the bramy particles and the germ which is more or less intermixed with low grade flour, those elements do not seem to be affected by this gas so far as color is concerned.

Q. And is there a difference in the granulation, or quality

of the flour, itself, low grade, as compared with patent?

A. Of course the low grade flour won't make as good a loaf of bread as the patent.

Q. Whether bleached or unbleached?

A. Whether bleached or unbleached, it won't make as good a loaf of bread as the patent or the bleached. I have judge, here packages of unbleached and our bleached flours, if you want them in evidence, if you think it is worth while.

Q. Have you them here? A. Right here.

Q. Would the colors be observable in these lights?

Judge Scarritt: We object to the samples; that comes bleached under different conditions; he says the bleacher affects it and the location affects it, and all that sort of thing.

The Court: Objection overruled.

Judge Scarritt: We object to it and save our exceptions to the ruling of the court.

Witness: This flour, I would say, was not bleached in our mill, it was bleached here in the chemical laboratory.

Judge Scarritt: We object to that for the same reasons and the additional reason that—did you bleach it yourself? A. I was with the gentleman when he did it.

Q. Did you bleach it yourself?

A. You mean did I hold the machine in my hands?

Q. Yes, sir. A. No.

Judge Scarritt: I object.

The Court: Objection overruled. To which ruling of the court claimant then and there duly excepted.

By Mr. Butler:

Q. You saw the bleaching?

A. I saw him do it, yes.

Q. It has been done since the adjournment of court last night?

A. It was done last night and I was with him when he did

Q. And you observed a great deal of bleaching by Alsop's process, of course? A. Yes.

Q. And you also observed this bleaching? A. Yes, sir.

Q. And you may state whether or not the effect is the same.

A. As far as I can see there is no difference.

Q. Now, you may show the unbleached and bleached. Now, what is it you bleached?

A. I have here our patent 55 per cent, and that is unbleached, and I have clear 35 per cent unbleached, and we bleached yesterday the clear, I can show you.

Q. Now, before the bleaching what was the relative color?

A. Before the bleaching the patent was whiter than the clear.

Q. And after the bleaching?

A. After the bleaching the first effect of the clear is to be whiter than the patent; after they dry out, a dull sickly color comes over the bleached flour, as it generally does, but I can show you directly that the clear flour bleached is whiter that the patent unbleached.

Q. Now, a little more as to the description of that. You speak of a dull sickly color coming over the bleached flour?

A. Yes, sir.

Q. After time elapses after the bleaching. Now, what is the fact with respect to the unbleached flour as to its color; can you describe the color?

577 A. Well, unbleached flour when first made has a color that is rather bordering on yellow, a yellowish hue, creamy but still a yellowish cream, and if that flour is set aside a month or two months it seems to what we call bleachout, the yellow to a certain extent leaves it, and it becomes a brighter, creamier, whiter color; I think all of the flours that I have ever examined do turn whiter with age.

Q. And does quality also improve with age?

A. The quality also improves. Flour that has been set aside for a month or two will make better bread and give better satisfaction to the baker and the housewife both, than flour which is fresh from the mill.

Q. You refer to bleached or unbleached flour?

A. Unbleached flour.

Q. How about the bleached in that regard?

A. So far as the bleached flour is concerned I think that it deteriorates from the day it is made and bleached.

Q. Goes down at once.

A. I think it does, it goes down until finally that pretty bloom is gone and it assumes a sickly lavender or purplish hue.

Q. Now, you may show the effect of bleaching of this clear flour as compared with the unbleached patent.

Judge Scarritt: We object to that for the reasons here-tofore given.

The court overruled the objection; to which ruling of the court claimant then and there duly excepted.

A. Shall I make the test?

By Mr. Butler: Q. Yes, sir.

The Court: No tests made, I think.

Mr. Butler: He has the flour, but what he means by the test is simply have a piece of wood and smooth it down, put one right down by the side of the other; it wont take but a moment.

The Court: Well, all right.

578 Judge Scarritt: I understood Your Honor to rule that there were to be no tests?

The Court: I did, but I likewise ruled on your behalf yesterday that you could present exhibits that you had here in the shape of flour, and that was done.

Judge Scarritt: We are not making any tests.

The Court: Oh, you have forgotten, Judge Scarritt, you had a gentlemen up here trying to smell flour yesterday; that was only on yesterday. Now, then, they have to take the other one of the five senses and look. I cannot certainly be mistaken over what occured here within the last twenty-four hours.

Judge Scarritt: I don't think you can, Your Honor, your memory is pretty good.

The Court: Well, if I am mistaken, Mr. Smith wont endorse you on that.

Judge Scarritt: I am not objecting to that; I am not objecting to his smelling anything.

The Court: Oh, they used to tell me there were five senses. Do you claim that you can use the one sense of smelling, but not the other of seeing?

Judge Scarritt: I am not objecting to his hearing, tasting or smelling, but I don't know what kind of a test he is talking about.

The Court: Objection overruled.

To which ruling of the court claimant then and there duly excepted.

The Court: Lay out some of that flour on one of these boards and do it while we are talking about it.

Mr. Butler: You have seen them do it, haven't you, you know whether it is a test or not?

The Court: Let's spend no time, let's get right at it.

Witness: I can do it in a minute, Judge; give me that full of water.

579 Mr. Smith: Your Honor, this is going into the experimental stage.

The Court: I can do it myself; put some flour on that board.

A. Yes, sir, I can do it.

The Court: Bleached or unbleached?

Mr. Smith: I do not object to that.

The Court: We cannot make any chemical tests here.

Mr. Smith: I do not object to the chemical tests if the bar is going to be opened for chemical tests.

The Court: The trouble is—I got the idea by a hurried examination the other night of Wigmore—the great trouble is if you make tests, in carrying it into the record in proceedings for review, and it looks to me like that is a valid objection. Whoever is defeated in this case has a right to have the case reviewed on the evidence, and you cannot got these chemical tests made in the presence of the jury into the record.

Mr. Smith: I understand.

The Court: Now, that is what impressed me.

Mr. Smith: I am not going to object to that at all if we can have the understanding that tests are to be made by both sides I am willing that every conceivable shall be made here by him if he wants to, but of course, I shall claim the same right when we come to our testimony.

The Court: Oh, both sides will claim that, and you know I have ruled against it.

Mr. Smith: If they are not to be permitted we shall object to that,

The Court: Put some flour of each kind on that board or some other board side by side.

Mr. Lyons: Your Honor, may I make this suggestion?

The Court: Now, all you gentlemen can give me lots of instructions by your arguments, but we will never get through with this case.

Mr. Lyons: He wants to dip them in the water so as to preserve it on the board.

The Court: I don't care what he wants; it will not be done; put it on the board; anybody knows how to do that.

580 By Mr. Butler, resuming:

Q. Have you prepared specimens of these flours side by side for the purpose of comparison of color? A. I have.

Q. Is this the usual way millers and bakers, and others

compare it?

A. It is the way, as far as I know, it is practically the way all millers do, slick it down and dip it in water.

Q. Is the comparison made before or after the flour is dipped

ip water, usually?

A. They dip it in water first, as a rule, you can compare it better, dipping it in water has a tendency to bring out the color; it shows it plainer.

Q. The comparison is more plain after.

A. Easier to see the difference after wetting than it is before.

Mr. Butler: Is there any objection to this being dipped in water?

Judge Scarritt: No, if you will let us experiment we will let you, that is all there is about it.

Q. You may show the flour to the jury.

A. (Witness exhibits the two samples of flour to the jury.) This is our patent and clear, both unbleached. It is very hard to see with the gas light. The patent is on that side, and the clear is on this side; the line is down through the center. Now, this is our patent flour unbleached, and this is our clear flour bleached—very little difference, I think you would hardly be able to see it by gas light; have to get it in the daylight to see it, and then the color shows plainer if it has been wet. This is patent on this side and that is clear on that side.

Judge Scarritt: We object to the witness arguing the matter to the jury, if Your Honor please.

Mr. Butler: I don't think it is an argument to the jury.

Judge Scarritt: It is marked on the board there just exactly what it is. That is all the jury wants to know.

Mr. Butler: I still think it is not an argument.

The Court: Well, go on.

581 Q. Now, have you become familiar with any method of chemically testing flour to ascertain whether it is

bleached by this gas or not?

- A. Yes, sir. Our attention was first called by a firm at New Orleans that made, I think two liquids and on mixing them together, and dropping a drop on the bleached flour, as a rule it turns it pink, and on the unbleached flour it apparently does not; it turns it the least little bit, but does not turn it to the color of the other.
  - Q. And what is the color of the liquid you say you drop on?

A. It is clear, practically a water color.

Q. Is that known at the Griess test of Griess-Vilosa test?

A. I think it is, but I am not sure.

- Q. And the bleached flour will turn pink under a drop of that? A. Yes, sir, turn pink.
  - Q. And the unbleached flour remains unchanged?

A. Yes, sir.

#### Cross-Examination

By Mr. Elliott:

Q. Mr. Ballard, I think you stated you were a stockholder of the Alsop Company. Will you just explain that situation?

A. Well, the first time I ever heard-

Q. Just let me ask you this, you are a stockholder, are you not, of the American Milling & Purifying Company?

A. The American Milling and Purifying Company.

Q. And you stated that company-

- A. That is in some way consolidated with the Alsop, I don't know exactly.
- Q. But your stock is in the American Milling & Purifying Company?

A. Yes, sir, which is the Alsop Company now, I believe.

Mr. Butler: What was that, Mr. Elliott, change of name or taking over?

Mr. Elliott: Simply took over its name.

Mr. Butler: Took over the property.

By Mr. Elliott:

Q. Now, I understood you to state that you never smelled the odor of this gas in the flour?

A. I am not sure that I ever smelled the flour at all

582 to see if I noticed the odor.

Q. And I will ask you if you ever observed any color, or first, if you ever tried to ascertain if this gas differed in color from the Alsop machine?

A. No, I never tried to ascertain.

Q. And you never noticed if it had any color or not?

A. No, I never noticed any color.

Q. Well, I believe you have stated that you took some flour

and held it under the pipe?

A. We had a pipe that came—about two inch and a half pipe, that came down where our flour testing table was, and setting up, say within probably a foot of the table.

Q. Yes.

A. And we had, of course we had a valve for the closing of the pipe, and, as I say, we put a board underneath that pipe, to let the gas blow on the board for these special tests that we used to make sometimes; I never noticed any color in that gas, no.

Q. Then when you made that test you couldn't see any

color?

A. I never noticed any color, no, sir, never did.

Q. Now, as I understand it, you would hold this flour to this pipe and bleach the surface of it to ascertain if you were getting the bleach you desired?

A. Yes, sir, to see if—just to experiment to see whether the flour should be bleached more, or we were bleaching it sufficiently, and just to test our flour, yes, sir.

Q. Now, when you found you had gotten the-I think you

denominated the maximum bleach, did you?

A. Well, the bleach that we desired, we never bleached our flour to the maximum; we were afraid to do it.

Q. Now, when you had bleached the flour, and the color was white? A. Yes, sir.

Q. You understand? A. Yes.

Q. Now, do I understand you to say that you could still

bleach that and make it whiter? A. Yes, sir.

Q. And when you got the maximum whiteness, that is to say, if you bleached the flour to the maximum extent, as you have stated? A. Yes.

583 Q. Then you don't mean that you can still go on and bleach and have any change in color, do you?

A. Yes.

Q. Make it still whiter?

A. It becomes after you continue to bleach on for any length of time, it becomes, as I said, a sickly lavender or purplish color.

Q. I am not speaking now about bleaching in lavender; what I mean is when you get the white color, or the maximum bleaching, as you may term it, then the flour does not go on and still get whiter from bleaching?

A. As I understand it, Judge, the flour has a yellowish hue to start with, a cream color. If we bleach it a little, some of that color matter is taken out; if you bleach it more, more

color matter is taken out; and the more you bleach it the whiter it gets up to the point that it begins to go back then, and gets this lavenderish color. There is a point, up to a certain point it keeps on getting whiter and whiter and whiter, and after that it gets lavender, more lavender and still more lavender, yes.

Q. Well, you don't make lavender flour?

- A. We try not to. That is why we only bleach to a certain extent.
- Q. Now, as to this flour in the agitator, I understand you to say that this flour became—that lodged in the corners, as it were? A. Yes.
  - Q. Became discolored? A. Yes.

Q. In time? A. Yes.

Q. How long did you say that would take?

A. Well, I should say, depending on the amount of gas that was applied to it, different places, there seems to be more of it than other places, two or three months.

Q. It begins to get stained?

- A. Yes, sir, get this yellowish color.
- Q. And the miller cleaned it out every two weeks, as I understand? A. Every two weeks.
  - Q. Now, as regards bleaching, how long does it take you to treat your flour in bleaching?
- 584 A. Well, so far as I know the effect of the gas on the coloring matter in the flour is almost instantaneous.

Q. It is almost instantaneous?

A. Probably the flour would remain in the agitator with the gas, in passing through it, I should say, oh, thirty seconds, maybe possibly, I don't know.

- Q. And this discoloration, that is what I want to bring out, this discoloration there you referred to is where flour has lodged in the agitator and been subjected to it for two or three months?
  - A. And been there continuously some two or three months.

Q. Or maybe even longer?

- A. Oh, it might be, it gets yellower and yellower as it goes on.
- Q. Now, these pipes that had been in use two years, they were galvanized iron pipes? A. Galvanized iron pipes.
- Q. That is substantially the same that you would have in a rain spout?
- A. Well, rain spouts usually, I think, are tin, but these were galvanized iron.

Q. Well, I mean substantially the same thickness?

A. Yes, sir, they were light just such as the tinner put up for us in the beginning; I did not particularly inquire as to their thickness or their gauge.

Q. As a matter of every day common knowledge would not such a pipe if left out exposed to the atmosphere, rust every two years, rust and decay?

A. Oh, galvanized iron, of course, does not rust as readily

as other iron.

Q. I know, I didn't say as readily, but as a matter of experience?

A. I think there is no question about it that it will rust in

time, out in the open, out in the rain, yes.

Q. Now, I believe you stated you did not remember the percentage of what you have termed your patent flour that you were making when you started to use this Alsop machine?

A. Well, our policy always has been to make such a per cent of patent that would give satisfaction, such a per cent as

we could. Q. Yes.

A. And we experimented from time to time, and our per cent of patent has varied at various times, as to the quality of wheat that we did use at that time I do not really remember; we sometimes would make probably sixty, sometime seventy, and it may be that the very particular time that we adopted the bleaching we may have been making 85 per cent, which we were making when we started, but we had various ways of swinging certain flours into the patent and out of the clear to some extent, according to the demands of the trade, and to some extent as determined by the wheat that we were milling if it was sufficiently good to make a larger per cent that you can make from common wheat.

Q. State what you mean by swinging the same flour into the patent and some out of the patent; what do you mean by

that?

A. I can illustrate this by the separator in making cream, you can make cream of almost any thickness by setting the separator, you can make a thicker cream or a thinner cream, and you can make more cream or less cream. A Jersey cow will give more cream to the amount of milk than a Holstein cow. The same with our wheat; we take good wheat and plump wheat and nice soft wheat, we can put a larger per cent of that wheat into our patent flour than if the wheat is broken, shriveled and more or less injured and damaged. Now, practically speaking, it is impossible for us to always get every grain of our wheat of very high quality. Crops change, weather changes, conditions change and as conditions do change we draw a larger or smaller per cent of patent, always making as much as we can, Judge.

Q. Yes, and that percentage, you have stated, I believe,

would go up as high as-might go up as high as 85?

A. At the time that we stopped bleaching, and it may have been for four or five years preceding, I don't really remember, we were making 85 per cent of patent flour.

Q. And, in your judgment, that is a patent flour?

A. Well, I don't-

Q. You called it such, at any rate?

A. Well, our brand—we don't brand it anything, we just brand it "Ballard's Obelisk Flour", but in my judgment, a winter wheat mill in my section cannot make a good patent 85 per cent; now spring wheat in Kansas and the West will make a larger per cent of patent than ours.

4. But just to get the straight, now, I understood you to say that possibly before the bleaching you were making per-

haps as high as 85 per cent patent?

A. We may have the same per cent during that entire time, I would not say that we did not, I really don't remember.

Q. But your information or recollection would be that it may have been during the time you were not bleaching, your percentage may have been just as high as it was after installing it?

A. It may have been. I will say if you will accept it in evidence, a great many mills never change their per cent at

all when they began to bleach.

Q. Now, as I understand it, you state you are making a 55 per cent?

A. Now, we make a 55 per cent patent.

Q. Now, was that change in percentage made by you for commercial reasons?

A. I will say that it has been my custom to examine the different flours in our mill while we were bleaching I would go over to the mill and begin examining different flour.

Q. Well, I-

A. I am only going to tell you why I changed to the smaller per cent.

Q. I just ask you if the change was made for commercial reasons?

A. It was made to make our flour better. When we stopped bleaching I found that a part of our mill was not doing good work, and I had not known it while we were bleaching. I would say to the miller, for instance "Your fourth grind is whiter [that] you first grind. Why is it?" "Why" he says, "Some gas gets into the machine"—

Q. I have no objection to your giving this at the proper time.

A. And therefore afterwards when I had occasion to get into the mill and we could understand the mill, and we got the mill after we stopped bleaching, and I could really tell, I found there was being swung streams of flour into the patent flour which I did not think should go in, because they were not good enough to go in it. Well, I took them 587 out and put them into the clear.

Q. But if you had been grinding at that particular time a high grade of wheat, as I understand it, that stream

might very properly have gone in?

A. No, there were certain streams that were going in that

ought not to have gone in.

Q. I understand, but I say, if you had been using a high grade wheat?

A. It varied to some extent, but some streams were going

in that ought not to have gone in at all.

Q. Now, I understood you to say that you can bleach what you have denominated your bleached flour and make it whiter [that] your patent flour unbleached? A. Yes, sir.

Q. That is on the basis of your present arrangement of

milling? A. Yes.

Q. Now, I will ask you if that clear flour that you have bleached will not still possess a color different in character from the patent flour unbleached?

A. Yes, sir, the patent flour unbleached will retain that bright creamy color, and the clear flour bleached will be that

sickly white.

Q. Yes, the two colors are very markedly different, are they not, the character of them?

A. They are still different and always will remain so.

Q. Now, I will ask you, Mr. Ballard, if you put an unbleached clear beside of an unbleached patent, won't that clear flour still possess that peculiar, what you term a sickly color, as compared with the patent?

A. I like the color of the patent better than the clear al-

ways, but there is very little, except the patent is whiter.

Q. I just want to get a direct answer. The character of the color of the clear unbleached will still be different from the character of the unbleached patent, very slightly?

A. Yes.

Q. What in your judgment, is this sickly color of the clear due to?

A. You mean the bleached flour?

- Q. Either bleached or unbleached, it don't make any difference.
- 588 Mr. Butler: He didnt say that the unbleached had a sickly color.

A. No, I don't think it has.

Q. The unbleached—the clear flour is not as good a product?

A. I don't think the clear flour is as good a product as the patent flour.

Q. Yes, this is unbleached now?

A. Unbleached. Now, the flour made in our mill, to start with, our patent flour is the first grind of our middlings, the first, second, third and fourth, we put, down to the fourth grind, into our patent, and those flours are more or less free from what you would call germ, the branny particles, and the woody fibre. That is the purest flour that we make. Now, as you go on down in your grinds there is more or less woody fibres get into the flour, and more or less germ gets into the flour, and more or less branny particles, which are cut up so fine they cannot be separated by bolting at all, go into the clear, and of course as you go down into the mill, the old grist will contain a larger percentage of woody fibres, germ and branny particles, and it is still weaker and still less desirable color.

Q. Now, I will ask you, Mr. Ballard, as to these impurities you have spoken about in the clear and that the bleaching has

no effect on their color?

A. As far as I know the bleaching has no effect whatever on either the germ, the woody fibre or the branny fibre; it does not seem to affect them in the least degree.

Q. Then isn't it true in your experience, Mr. Ballard, that in your clear flour, so far as the flour contents are concerned, there would be a greater contrast between the product of that flour and those impurities after bleaching than there would be before bleaching.

A. Well, that question has been discussed a great deal, but the amount of the branny particles, whether bleached or unbleached, in the clear flour, is so completely overshadowed and covered up by the flour particles that you cannot see in the bleached flour, in my opinion, the impurities any better

either in the bleached or unbleached. It is not material

589 from a commercial standpoint, in my opinion.

Q. Let me ask you if you had a purification system sufficiently fine to remove those impurities from the clear, what would you say as to its color?

A. It would be whiter, of course.

Q. Now, then, take the patent and the clear after bleaching. A. Yes.

Q. Now, I have understood you to say that the clear has a sort of sickly color as compared with the patent?

A. The clear bleached has a sickly color as compared to the patent unbleached.

Q. I will ask you what, in your judgment is that sickly color of the clear due to; was it due to impurities in the clear?

A. No, it is due to the bleaching.

But I mean the color that is imparted to the clear is not imparted to it by the bleaching, is it; that does not make the clear flour sickly, do I understand?

So I understand, it is not sickly when it is unbleached.

It is not due to the inferiority of the clear?

Well, that sickly color appears in the clear flour when it is bleached, and not when it is aged naturally, if you age it naturally, it is not there apparently, when you bleach it it is; now, I think it is in the bleaching.

Q. I understand; but I understood you to testify that this distinct difference in color obtains as between the clear un-

bleached and the patent unbleached?

A. I think the patent by this bleaching assumes after a

while that sickly color also.

Q. I am not asking about that just for the present. I say there is that same difference in the character of the color in the clear before bleaching, as compared with the patent, that condition exists, and did, the color, irrespective of bleaching?

The clear flour in our mill is not as good a color as the

patent, no.

But isn't it a fact that it is due to impurities in there, Q. don't you think?

A. Yes, sir, I think so. I think it is due to the impur-590 ities that are in the clear, yes.

And those impurities, in your judgment, would inevitably have some action in modifying the color of the clear flour?

A. Undoubtedly, I should say Judge, it may be. It is a very technical question as to whether or not middlings is whiter, and whether the inside or outside of the flour is more white or less white, but that is fairly technical, and I do not feel like taking that up from a milling standpoint.

Q. All right, I won't ask you about that. Now, you also testified, I think, that if you take these three grades that you have referred to, patent, clear and low grade A. Yes.

Q. And if you should bleach them all? A. Yes, sir. Q. I understand you to say you don't bleach the low grade?

Yes, we did bleach, but-I understood you to say-

Q. I say we tried to bleach, but it improved but very little

as compared to the other grades, in color.

If you should bleach these three grades you say the same difference the same relative difference will exist in the product after bleaching as would exist before bleaching?

A. Yes.

I believe you stated that you did not place the word "Patent" on your flour, is that correct?

- A. No, our brand is just "Ballard Oblisk Flour, Louisville," that is the brand.
- Q. You used this Alsop machine from the year 1904 to the year 1909?
- A. Yes, I think we started it in the year 1904, in that winter sometime, yes, that fall.

Q. Used it all the time?

A. Yes, sir, used it continuously.

Q. Now, I will ask you what is the color, the natural color of flour made from the wheat of your section of the country, which I think is a soft winter wheat?

A. Soft winter wheat.

- Q. As compared with the color of the flour made from the wheat of this section, say Kansas, Nebraska and Missouri and Iowa?
- A. It has always been understood by us that our wheat made a whiter flour than the Kansas, but not so rich in gluten.

Q. Yes.

A. Bakers won't have our flour at all, as a rule.

By Mr. Lyons:

Q. What is that last statement?

A. Bakers won't use our flour at all, as a rule. We sell no bakers at all.

By Mr. Elliott:

Q. And with this bleaching process not in use, you would possess an advantage from that natural condition that exists as respects the wheat, over a miller in your position in this section of the country, would you not?

Mr. Butler: Well, I object to that as immaterial.

The Court: Oh, he may answer.

- A. The flour from wheat grown in the Ohio Valley is whiter, as I understand, than flour made from wheat grown in Kansas; Iowa makes a whiter flour than ours; but ours is whiter than Kansas.
- Q. Yes, well, you would possess an advantage in that respect over a miller in Kansas?

A. You mean to the family trade or to the baker trade?

Q. Well, family trade.

A. Yes, the same advantage would obtain, however, if both of us bleached, you understand that.

By Judge Scarritt:

Q. If both were bleached.

A. If both were bleached, the same relative difference would exist as if they were unbleached; our bleach is much whiter than Kansas flour will.

By Mr. Elliott:

Q. Mr. Ballard, have you not gone on record as stating that your objection to this bleaching process was selfish, and I mean by selfish, for your peculiar personal advantage, and for commercial reasons? A. I want—

Q. Well, you may explain afterwards. Just answer the

question.

A. Well, I don't know what you mean by "on record".

Q. Gone on record. Well, have you made a speech of that kind?

A. I made one to the Southeastern Miller's Association.

Q. I am going to ask about that, but I say have you made

a speech of that kind?

A. I have no doubt I have. I think that without bleaching we have the advantage over the Western and Northwestern millers the same as we have with bleaching, but that 592 without bleaching I think our flour is the best flour in the world, yes, sir, I think Kentucky raises the finest wheat in the world.

The Court: The best looking women and the best horses.

A. The best horses and the best whiskey.

The Court: All right. You take any issue on that, Judge?

Judge Scarritt: No, sir, it makes me thirsty, and I have no objection to making tests on the latter proposition.

The Court: Well, we can wait a half an hour. Of course that is simply with reference to another matter; you can lay the foundation; we cannot tramp all over those millers' conventions. Ask him the question direct if you want to reach that.

By Mr. Elliott:

Q. Now, I will ask you the direct question, if you placed yourself on record by public speech or otherwise as stating that your objection to the process was for selfish reasons and for the commercial advantage for the commercial advantage the doing away of the process would give you?

A. Well, I went to the meeting-

The Court: Now, Mr. Elliott, you still don't get to the point. This question can only be admissible for one purpose in the world, which you and I both understand. You must ask him the place, time, persons present, and so forth. Now, let's get at that in an orderly way.

Q. At a meeting of the Southwestern Millers' Association?

A. Southeast.

Q. Southeastern Millers' Association, I should say.

A. Yes, sir.

Q. About a year ago, wasn't it?

A. Probably a year ago, more or less.

Q. Now, you can answer the question with that amendment? A. The association—

The Court: Wait till he gets his question.

By Mr. Elliott:

Q. At this particular meeting did you go on record in that regard?

A. The association of millers known as the Southeastern Millers' Association comprises the millers along the Ohio Valley and Tennessee and—

Mr. Elliott: Won't you answer that question?

The Court: Now, Mr. Elliott, I am having more trouble with you than with the witness. Ask him if he didn't say thus and so in such and such a place and such and such a presence. Now, let get at that.

Witness: I told the millers-

The Court: No, don't make any difference what you told them.

By Mr. Elliott:

Q. At the meeting of the Southeastern Millers' Association about a year ago did you say—

The Court: Where?

By Mr. Elliott:

Q. At Nashville, Tennessee, in substance, in a public speech, that your objection to the use of this Alsop bleaching process was for selfish reasons and for the commercial advanage the abolition of the process would give you as compared with millers in other sections of the country, substantially that?

Counsel for libelant objected to the question as immaterial.

The Court: He may answer.

A. I have no objection to telling what I did say.

The Court: Answer the question, please, yes or no, did you?

A. Well, Judge, I did not put it in that way; I didn't say just that sentence as far as I remember.

Q. I say substantially, or in words to that effect?

A. I told these millers-

Mr. Smith: No.

Witness: I am perfectly willing to say, yes, I said words to that effect.

The Court: That is all.

Mr. Elliott: I think that is all.

594 Redirect Examination

By Mr. Butler:

Q. What did you say to them?

A. I told those Southeastern Millers that all the hue and cry raised about bleaching was done by the bleaching men themselves.

Judge Scarritt: Wait a minute, if Your Honor please.

The Court: He has a right to bring that out, he said he didn't say it, now, what did he say?

A. No, I said words similar to that.

Mr. Butler: I want to show how similar they were.

The Court: Go ahead.

Judge Scarritt: Just a moment. The question is if he said substantially the words at that time and place, he answers that yes; that ends it; if he answered it no, then he can answer what he did say and I make the objection to this cross-examination for the reason that he has said he made substantially that remark at that time and place.

The Court: He said—I don't repeat him in words—he said that he made that remark, but not in that way, or something of that kind.

Judge Scarritt: He said substantially.

The Court: Well, he may answer now. Make this short.

To which ruling of the court claimant then and there duly excepted.

Witness: Judge, I meant to say to those millers that the wheat grown in our section had all the qualities necessary for good bread making wheat for family use; it has strength enough, it had color enough, and it did not need any outside or aritficial rushing or powdering or coloring up or chemicals to make it good. That is what I told them.

By Mr. Butler:

Q. Is bleaching a part of the milling process?

A. The milling process, as I understand, consists, Judge, I consider this not—I consider the milling process consists

in making pure flour and separating all impurities from the flour; that is what I consider the art of milling; and after the

flour is made I do not consider that then treating it

595 with chemicals is part of the milling art.

Q. Now, you told me, as I understood you, in your answers to my questions indirect, that you bleach your patent and your clear and your low grade; bleached them all heavily?

. While we were bleaching we had them all in the bleach.

yes.

Q. So the color of the low grade was affected, the color of the clear was affected and the color of the patent affected

in like stages? A. Yes, sir.

Q. But if you bleached the lower grade, the clear and the low grade more than you bleached the patent, they would be brought up close together?

A. Well, the more you bleached them the whiter they got.

Q. Now, with reference to this sickly color and the lavender; does that go to your 55 or 60 per cent or high grade?

A. Well, they are overbleached; the bleaching seems to continue after it is put in the barrels, and when you bleach it it keeps on, and after a month or two all flours that have been bleached that I have examined have that sickly lavender hue.

Q. You say after it is in the barrel and shipped and sold?

A. After two or three months, yes, it keeps on bleaching.

Q. Now, have you observed whether it is true if it be bleached flour, as far as you can go with turning it yellow.

A. No, I have never made that test.

Q. But with the degree of bleaching that you gave it?

A. Yes?

Q. It continued to work all the time?

A. Continued to bleach even in the barrel and continuously.

Q. By the way, I intended to ask you in direct examination whether or not you had this scheme or invention of Professor John A. Wisner in your mill for a while.

A. Yes, sir.

Q. That is called the nitrocele chloride?

A. I think so; we experimented with that.

Mr. Butler: Is that chloride or chlorine?

Mr. Elliott: Chloride.

596 Q. Now, that produces a gas too?

A. That was gas itself, that had been compressed and shipped to us.

Q. And how did that gas smell compared with the Alsop gas?

Mr. Smith: I object to that as immaterial.

The Court: Oh, I think so. Objection sustained.

Mr. Butler: Your Honor, the purpose of this is a foundation question, for the effect of other flour treated by NO2, our contention is that NO2 is the same wherever used.

The Court: I know, but he doesn't know what this was.

Mr. Butler: He knows as far as smell is concerned.

The Court: Objection sustained.

### Recross Examination

By Mr. Elliott:

Q. Just two questions, if Your Honor please. As bearing on the bleaching as you have given it in that where you put the flour under the pipe. A. Yes.

Q. And bleached it, you say if you had put that flour back

again it would still have bleached more?

A. We would slick the flour down and put it under the pipe, and sort of test it along under the pipe and it would be bleached a certain amount, I could test it along under the pipe again, and it would be bleached more, and I could hold it under the pipe for a half a minute continuously and it would be bleached still more.

Q. And after that period?

A. Well, there was a time when I don't remember that it made any difference.

Q. In other words, you say that if you put that flour under the pipe and bleached it— A. Yes.

Q. Letting the gas run on the surface? A. Yes.

Q. And take it away? A. Yes.

Q. And then bring it back again, that you could bleach it still more?

A. No, I say we just sort of tested this way, just tested right under the pipe, and it bleached a certain amount; I

could place it under the pipe a second time, it would 597 bleach it more; I could hold it under the pipe say continuously for half a minute and it would bleach it apparently as much as it could be bleached.

Q. Yes, sir, and it would not bleach any more after you

put it back again?

A. I do not recall, I should imagine not, no, sir.

Q. Now, you stated the more you bleached these flours the lighter they get. Now, let me ask as to that clear flour: You say that the more you bleach that clear flour the lighter it will get?

A. As I tried to explain that when you bleach a certain amount it turns, it takes off some of the coloring matter; if you bleach it more it takes off apparently more of the coloring matter, and there is a certain point that it apparently is as white as it can get. Now, then, exactly how much that can

bleach I am not prepared to say; it might be bleached more; we can try it and see.

Q. But do you say that the more you bleach that clear

flour the lighter you can make it?

A. Judge, it gets whiter and whiter with a certain amount of treatment, but after you had it up to the point as white as it will get, then the more you bleach it after that, it doesn't whiten it, no.

Q. What relation do the impurities in there have to that?

Mr. Butler: I think this is not cross-examination, all gone over.

A. The impurities, as far as I know, do not bleach at all.

The Court: He said he would only ask two questions. Go on.

- A. So far as I know the impurities, the branny particles, the germ and the woody fibre do not bleach at all with this gas; they may bleach with another gas, but not with this one, as far as I know.
- Q. Therefore the branny particles, if you continued to bleach it and make it whiter as you said, would necessarily be more prominent than they were?

A. After they would be separated, yes.

At this point court took a recess until 2 o'clock P. M.
598 Kansas City, Missouri, Wednesday, June 8, 1910.

Court met, pursuant to adjournment, at two o'clock p. m., Wednesday, June 8, 1910, and proceeded with the trial of said cause, further as follows:

William Wolf, called as a witness on behalf of the government, being first duly sworn, was examined, and testified as follows:

### Direct Examination

By Mr. Butler:

Q. Where do you live, Mr. Wolf? A. Baton Rouge.

Q. What is your first name? A. William.

- Q. William Wolf? A. Yes, sir. Q. And what is your business?
- A. I have been raised up in a bakery, since I was a boy.

Q. You are a practical baker? A. Yes, sir.

Q. Are you engaged in the baking business, at Baton Rouge?

A. Yes, sir.

Q. Are you one of the owners of the concern?

A. Yes, sir.

Q. And how large a bakery have you, there?

A. Why, we turn out three thousand five hundred loaves a day.

Q. Thirty-five hundred loaves a day? A. Yes, sir.

Q. Do you bake bread only, or bread and other things?

A. Bread exclusively. We make a very few Jenny cakes,
—hardly ever amounts to anything.

Q. But your baking is practically, wholly confined to bread?

A. Yes, sir.

- Q. Have you had any experience in the use of bleached flour? A. Yes, sir.
  - Q. What kind? What brand of flour was it?
    A. "Seal of Minnesota", from New Prague.
    Q. How much of that did you have?
- 599 A. I had a car, two hundred ten, or two hundred twenty barrels. I couldn't say exactly. I disremember the exact amount of the car.

Q. Was it labeled as a patent flour? A. Yes, sir.

Q. And did you have some of the same flour that was not

bleached? A. Yes, sir.

Q. Now, you may tell us how the flour that was bleached worked, and how it compared with the same flour that was not bleached.

A. The flour that was bleached, the sponge—we always work sponge dough, down home. Sponge worked very fair, and got ready; and then after we made dough, everything seemed apparently dead. There was no life in it. It would not rise. Of course we gave it extra hours. More so, than we did on other occasions, and the stuff gradually came to very slow and worked unsatisfactory in every way after we made dough of it.

Mr. Smith: I move to strike out the last expression your Honor, about its being unsatisfactory in every way. That is merely an opinion, without a description of it.

The Court: Yes, you ought to state the facts.

Mr. Butler: Yes.

Q. Mr. Wolf, I didn't want you to say good, or bad, or unsatisfactory, or pleasing, but to tell us the difference between the two—how they acted in the pans.

A. The bleached and the unbleached?

Q. Yes. You may tell us, first, about the bleached.

A. Well, the bleached flour moved very slow, and, after the sponge was ready, and the dough was made, everything looked apparently dead. It appeared lifeless. Came very slow. We gave it extra hours. That was my experience with the bleached flour.

Q. Did it rise?

A. It raised very slowly. It never came up in volume, as it should have, at no time.

Q. How about the firmness of it, when it did come up?

Did it remain up, or flatten?

A. It began to flatten. It never would come up fully when it was back half way before it flattened entirely we run it into the oven and baked it out.

600 Q. Now describe the same flour that was not bleached.

A. The flour that was not bleached, she came better, and there was more elasticity to the dough.

Mr. Smith: Wait. I move to strike out that expression of the witness, that it came better, and there was more elasticity in the dough, as being incompetent, irrelevant and immaterial, an expression of opinion forbidden, under the court's ruling.

The Court: Very well. I don't know how a witness could express himself, very well. Of course, that is not for me to say. The answer may stand.

## By Mr. Butler:

Q. Go on, Mr. Wolf.

A. The flour that was unbleached there was more volume to it. There was more elasticity to the dough, and it held up better, and proved perfectly satisfactory, and went into the oven and held up just beautifully, and came right along, in every respect.

Q. When was this?

A. The bleached flour, I used it about April, 1909.

Q. And when did you get the unbleached?

A. It was September or October, 1909.

Q. Do you know the name of the man who was at the head of that mill? A. No, sir, I do not.

Q. Or the name of the mill? Was it called the New Prague Mill. A. Just called the New Prague Mill.

Q. And branded "Seal of Minnesota, Patent"?

A. "Seal of Minnesota, Patent".

Q. Is that the only experience you have had with bleached flour?

A. That is the only one that I can vouch for. I tested that, and was satisfied that the flour used in April was bleached, and the flour in October or September was not bleached. That is the only one that I can say positively. Still I had a similar experience about a year previous to that. Worked very much

the same as the bleached flour, but I never tested it.
am not in position to say it was positively bleached.

Q. But you tested both of these car loads, from the New Prague, Minnesota, man? A. Yes, sir.

Q. And one showed-

A. (Interrupting) To be bleached, and the other not.

Q. How did you test them?

I tested them with these acids,-poured on the flour and it reacted.

Q. How? A. By a pinkish color.

Q. By a pinkish color? That was on the bleached or the unbleached? A. That was on the bleached.

Now, describe more fully that pinkish color.

Why, poured the acid,-just merely a drop on the A. bleached flour, and it would react in the pink color, and the bleached flour, we poured it on, and there was apparently no change.

Q. What was the color of the stuff you poured on?

It was a white acid.

Q. White, or clear? A. Yes, sir, very clear.

Q. Like water? A. Yes.

Not like white paper, or chalky, but clear like water?

A. No. sir. Just like water.

Mr. Butler: I think that is all.

# Cross-Examination

By Mr. Smith:

One of these carloads of flour, bought in April, 1909?

Yes, sir. A.

And the other, about six months later? A. Yes, sir. Q. You don't know anything about how long that flour

that you bought in April, 1909, had been milled?

No. sir. I do not. A.

You don't know anything about the grade of the wheat? Q.

A. No. sir. I do not.

You don't know where it had been, in the meantime? Q.

No. sir. A.

- You don't know whether it had been ground six months, Q. or two years? A. No, sir, I don't know that.
- Q. Or whether it had been made out of Number 2 602 wheat, or Number 1 wheat, or no grade of wheat do you?

A. No. sir.

- You don't know anything about that? A. I am not an expert on wheat, at all.
- And the flour you got in 1909, you don't know anything Q. about that grade of wheat?

1909? They were both in 1909. A.

- I mean in September or October, 1909. Q. They were bought for high patents.
- A. But you don't know anything about the wheat from Q. which it came? A. No, sir.

Or how long it had been milled? A. No, sir.

Or whether it was from wheat that was raised in 1909 or wheat that was raised in 1908. A. No, sir.

And you don't know where the wheat was raised?

A. No, I don't know where it was raised.

Q. Nor you don't know anything about how long the flour had been ground? A. No, I do not.

Q. You don't know anything about where it had been kept

in the meantime? A. No, I do not.
Q. You don't know anything about—but let me ask, do you know about the different grades of flour? A. I do.

Q. Are you able to look at flour, and tell whether it is this grade or that grade? A. I can.

Q. Straight, or patent, or clear? A. Yes, sir.

Q. Now, did you examine either of these flours to determine the amount of gluten there was in each?

A. I examined them to determine the amount of gluten, but I never weighed it, and got it accurately.

never weighed it, and got it accurately.

Q. You didn't note any difference that way?

A. No, sir. I separated the starch from the gluten, though, and seen how much gluten was contained.

Q. Can you tell the jury how the amount of gluten in each one compared, as to weight? A. No, sir.

603 Q. Can you tell the jury how the amount of starch in each one compared as to weight?

A. I never taken any accurate weights. I only separated the starch from the gluten, for my own benefit.

Q. Yes? And do you know anything about the first car that you got, of your own personal knowledge? Do you know how it was bleached?

A. No, sir, I do not. I am not familiar with bleaching apparatus.

Q. You don't know anything about that?

A. Not the bleachers.

Q. Who was the party from whom you got this?

A. New Prague.

Q. That is, some place up in Minnesota?

A. Yes, sir, New Prague, Minnesota.

Q. Now, could you tell, by looking at the flour, whether it was bleached or not?

A. I could not tell, not exactly.

Q. They looked all alike, did they?

A. No, the bleached flour had a chalky look.

Q. Was that apparent? A. Was that apparent?

Q. Yes,-see it, can you? A. Yes.

Q. Plain to be seen? A. Yes.

Q. Anybody could tell it? A. I don't know about anybody.

Q. Well- A. (Interrupting) I know I could.

Q. Well, a person of the intelligence and observation that you have, could tell it. A. Yes, sir.

Q. You never got any two kinds of flour-that was bleached and unbleached,-milled from the same wheat, at the same time, and tested them, did you? A. No, sir.

Q. Now, it is true, is it not, and your experience as a baker has taught you, that different flours have different strengths of gluten in them, does it not.

Different flours have different strengths gluten, yes.

And different flours, as you work them up into bread will have different elasticity of the gluten, won't they.

A. Yes.

And different flours, bought at different years and different seasons of the year-some works up into bread, better than others, doesn't it? A. Yes, sir.

Q. A flour coming from the same mill, at different 604

years, some flour is better than others?

They have better crops, some years, than others.

Q. Yes, different grade of wheat?

I don't know anything about the different grade. A.

Well, I mean different quality. Some years it is better than others? A. Yes.

And the better the wheat, the better the flour?

Yes.

Q. It has been your experience, has it not, that, as a practical baker, some years you have no trouble getting flour that bakes up, and other years you do have trouble? That is true, A. That is true, yes, sir.

Q. And the flour you buy from one dealer will work up bet-

ter than flour you buy from another dealer, won't it?

A. Well-

(Interrupting) Or do all flours look alike to you? Q.

No, they don't all look alike to me. Some will work better than others, but I always make it a rule to buy high patent, from a reliable miller, and I always get the same flour. Runs very much level, as a rule.

Q. Yes, but in your experience as a baker, you have found that the flour you buy from this man, this week, would work up better than you bought from another man a month ago?

A. I don't scatter my business that way. I generally deal

with a reliable miller.

Q. Well, when you buy from the same mill, your experience has been that if you buy a car from him now, it may be different from one you would buy from him at a different time?

Well, if they had a bad crop, in that section, I usually

go to another part of the state, as a rule.

Q. Yes, but you don't want this jury to understand that all flours, got at different times, from different persons, even when they are unbleached, don't all work up alike, do they?

A. No. sir.

- Q. You have some that bake well, and some that don't bake so well? A. Yes.
- 605 Q. That is a common experience, in dealing with any commodity, isn't it? A. Yes.

Mr. Smith: I believe that is all.

### Redirect Examination

By Mr. Butler:

Q. Now, as to the amount of difference that you found in this "Seal of Minnesota", when it was bleached, and what it was when it was unbleached,—is that the same amount of difference that you usually found in flours, or was it less, or

greater?

A. It was a greater amount of difference. The bleached flour that I got was—I don't know—it was chalky, in color, and it was very dead, and the dough had no elasticity to it, whatever. You could pull it up and it would break off, right like that (indicating), break right off, and you take the other batch I got from [the], there was a considerable amount of elasticity to it. You could notice it, very easily, and there was a considerable amount.

O. That is, the unbleached? A. Yes.

Q. Of course, you are not familiar with these different processes of bleaching? A. No, sir.

O. All you know is about this test that you have described?

A. Yes, sir.

Witness excused.

John E. Mitchell, recalled, was examined further, and testified as follows:

## **Direct Examination**

By Mr. Butler:

- Q. Mr. Mitchell, you know the New Prague Mill referred to by the last witness? A. Yes, sir.
  - O. Who is the proprietor of that? A. Mr. Bean.

Q. You know the Williams process?

A. Yes, sir, I know something about it.

606 Q. That manufactures NO2, mixed with air, for bleaching, does it not?

A. I don't know anything about NO2.

- Q. You don't know anything about NO2? A. No, sir. Q. Does the Alson process employ NO2 for bleaching?
- Q. Does the Alsop process employ NO2 for bleaching?
  A. It employs air, modified by electricity, and I understand it contains a trace of NO2.
  - Q. So, you know about that?
  - A. I have heard of it, yes, sir.
- O. Now, this mill, at New Prague, at the time referred to by the last witness, when he got this flour, was paying your company, for that medium, was it not? A. No, sir.

Q. Hadn't it given you its note for twelve thousand dollars, to your company for permission to use the Williams process, on your claim that it used NO2, mixed with air, and that infringed the Alsop process?

A. No, sir, that isn't correctly stated. They have given

us their notes, but they have refused to pay them.

Q. Yes, but they gave you their note, and you have sued on that note, now, in the courts of Minnesota, and they are defending on the ground that the using of NO2 mixed with air injures flour, and that it is contrary to public policy to enforce any such contract.

Mr. Smith: Now, I object to that as incompetent, irrelevant and immaterial, and not the best evidence, and intended deliberately for a stump speech. Yes, sir.

By Mr. Butler:

Q. Now, let us find out whether the Alsop Company-

Mr. Smith (interrupting): Wait. I want my objection ruled on—incompetent, irrelevant and immaterial, not the best evidence.

The Court: Now, you are in a contest as to who should have the last word.

Mr. Smith: I made my objection.

The Court: Yes, your objection has been noted. Anything further in the matter? I doubt very much whether 607 anything is gained by these wrangles. It doesn't persuade me, at least. Now, I was not following it, all the way through, Mr. Butler.

Mr. Smith: Let us have the record read. That will show it.

The Court: Oh, no.

Mr. Butler: I want to be heard on the objection. The last witness, Mr. Wolf,—

The Court: (interrupting) —testified he got this flour from this Minnesota mill?

Mr. Butler: Yes.

The Court: Some, he says was bleached, and some unbleached.

Mr. Butler: Yes, and he tested them. And his test gave the reaction that characterizes the Alsop process, which has been described as the reaction of the NO2, or its products, introduced into the flour. The Court: Of course. The matter of this note, and whether it was paid or not-

Mr. Butler: (interrupting) Well, I am coming to that. Now, this witness is called for the purpose of ascertaining, if we can, and we have been trying to, from the beginning, whether this particular Williams process employs the same medium, so that this jury may have the benefit of the effect of the medium upon the flour. The testimony in the case is abundant that, no matter how produced, NO2, mixed with air, has the same effect upon flour.

The Court: Well.

Mr. Butler: Now, I asked him, as an adverse and unwilling witness, whether or not NO2 is employed in the Williams process used in the New Prague Mill.

The Court: What is the Williams process?

Mr. Butler: Why, the Williams process is nitric acid distintegrated by an electrode, which liberates the gas, and it is blown into the flour. Simply another way of making NO2. Now, he says that he does not know.

The Witness: What NO2 is? I believe I can explain all about it, Your Honor.

Mr. Butler: And he doesn't know whether the Williams Process employs NO2 and air. Now, I think he does.

The Court: Well, let us see if he does.

Mr. Butler: And I wanted to call his attention to his claims against this man using it, to show that he does know.

The Court: Go on, and let us see.

The Witness: I will be glad to give all the particulars, if that is what you want, Mr. Butler.

By Mr. Butler:

Q. I want to know whether or not the Williams process used by Bean, in that mill, employs NO2 mixed with air, to bleach the flour. A. Well, all I can say—

Q. (interrupting) No, now just answer the question, yes

or no, to that, is all I want.

A. Well, it has to be decided by the court. We have contended that.

Q. You believe it does, don't you?

A. I believe it does,

Q. That is the question. A. But we-

Q. (interrupting) That is all.

Mr. Smith: Now, that is not all. I want the Court to rule on my objection.

Mr. Butler: I withdraw the question.

The Court: When it has been withdrawn? That question has practically been withdrawn, because it has not been answered.

Mr. Butler: The question is not being pressed. His controversy with Mr. Bean about a note is immaterial, except when he declined to tell me whether or not NO2 was used. I was entitled to show what he claimed in that law suit.

The Court: That question was not answered, and, if it will make the record any better, I will say the objection is sustained to the first question. Of course, there was no objection to the last question. Now, I am going to believe, until the evidence has shown to the contrary, although the jury will not take this from me as a fact, that it is utterly immaterial how NO2 is produced.

609 Mr. Scarritt: Now, if Your Honor please, we object to that.

The Court: I must be allowed to state my own position, Judge Scarritt.

Mr. Scarritt: I understand that.

The Court: Not that I can do it so well as anybody else can.

Mr. Scarritt: But, we have the right to object to it.

The Court: I preserve the rights. I am going to hold, until I [here] evidence to the contrary, that nitrogen peroxide whether made through an Alsop process machine, or whether made by the Williams process, or whether made in the laboratory, is one and the same thing. I don't say it is a fact, but until I hear evidence to the contrary—I have been trying to find out whether you are going to put that in issue, and Mr. Elliott has three or four times declined to answer that question.

Mr. Scarritt: We object and except to the remarks of the court.

The Court: The court notes that counsel object and except to my statement.

Mr. Smith: Now, will I be allowed to make a statement on that, and give you my views?

The Court: Do you speak for yourself, or for your client?

Mr. Smith: I am stating my views, and I think I may say for my client, when I say we do not contend, and never have contended that the nitrogen peroxide is not the same, no matter how produced, but we do claim that flour treated with nitrogen peroxide in an agitator, subjected to it for fifteen or thirty seconds, is different from flour subjected to it in a closed bottle, for five minutes.

The Court: Now, we have been trying three days to get that answer. Now, let us understand that. And that is over Judge Scarritt's objection to my statement. Now, let us go on.

Mr. Scarritt: No, we cannot go on, until we get that 610 settled.

The Court: I think we can go on.

Mr. Scarritt: Now, if the Court will allow me to suggest-

The Court: (interrupting) Yes, I will allow you.

Mr. Scarritt: The statement made by Mr. Smith is different, to my mind, and to ordinary men, than that made by Your Honor.

The Court: I said nothing about an agitator, nor how long agitated.

Mr. Scarritt: I know you didn't. That is what we objected to.

The Court: Oh, no, Judge. Well, go on.

Mr. Smith: We are ready to go on.

The Court: I think we are beginning to see-

Mr. Scarritt: (interrupting) You should leave those things to the jury, Your Honor.

The Court: I will do the best I can to submit the case to the jury.

By Mr. Butler:

Q. What kind of an agitator was it, in the New Prague Mill?

Mr. Smith: I object to that as wholly immaterial.

A. I don't know.

By Mr. Butler:

Q. Did you furnish them a Mitchell agitator??

A. No, sir.

Q. There is such a thing, is there not?

A. Yes, but I don't remember ever furnishing the New Prague. They don't use our process.

Q. Do you remember having seen the plant?

A. I was in New Prague Mill, trying to sell them the process, before they bought the other.

Q. You have not been there since?

A. No, sir.

611 Q. So you don't know whether they use the agitator invented by you, or not? A. I do not.

Q. You have invented an agitator, called the Mitchell

agitator?

A. That is designed one. Didn't involve any invention,

hardly.

Q. That is sold to mills for the purpose of agitating flour, to mix it with NO2, diluted with atmospheric air, is it not? That is the purpose of the thing, is it not?

A. By exposing the flour to the action of this electrified

air.

Q. NO2, mixed with air? A. I imagine that is what it is.

Q. Yes, so do I. I am beginning to suspect it.

A. I have never denied it.

Witness Excused.

A. C. Comstock, called as a witness on behalf of the government, being first duly sworn, testified as follows:

# Direct Examination

By Mr. Butler:

Q. What is your first name? A. Archie.

Q. Archie? A. Archie C. Comstock.

Q. Where do you live? A. Ellsworth, Kansas. Q. In what county is that? A. Ellsworth County.

Q. How far from this city?

A. Well, I think it is about two hundred twenty-five miles.

Q. About two hundred twenty-five miles? What is your occupation?

A. I am head miller and mill manager of the Ellsworth

Q. How long have you been engaged in that business?

A. I have been head miller for four years, and head miller and mill manager for nearly two years.

Q. What is the capacity of the mill?

A. Four hundred barrels.

Q. Four hundred barrels per day? A. Yes, sir.

Q. Where do you get your wheat supply?

612 A. Well, locally, we have a line of twelve elevators, that range about one hundred seventy-five miles,—probably a hundred and fifty miles, to the farthest points. It is through the hard wheat belt.

Q. Are you familiar with the wheat known as Turkey hard?

A. I am.

Q. As raised in Kansas and Nebraska?

A. I am, as to the wheat raised in Kansas. I am not familiar, though, with wheat raised outside. I never had occasion to buy wheat outside of our own territory. That is, very much.

Q. It is the same kind of wheat, isn't it—the Turkey hard

-in Kansas and Nebraska? A. I think so.

- Q. Are you familiar with the wheat described as yellow berry?
- A. I have, a few times, had a very little of it mixed with wheat that we bought, east of us, but it was only a mixture, and a small per cent.

Q. Sometimes comes mixed with the Turkey hard?

A. Yes, sir.

Q. Grows with it, does it not?

A. Well, in our vicinity I don't think there is very much of it grown.

Q. But I mean, where it is grown. A. Yes, sir.

Q. Where the yellow berry does grow, it grows from the same seed, with the Turkey hard? A. Yes, sir.

Q. I understand those to be the facts, without dispute.

A. Yes, sir.

Q. Now, do you bleach the flour at your mill? A. We did.

Q. When did you commence bleaching?

A. A little over two years ago.

Q. And do you still bleach, there? A. No, sir.

- Q. What process did you use? A. The Williams process.
  Q. You may describe the essential features of that process.
- A. Well, it is this: nitric acid is used in a cell with two electrodes, projecting through and the acid created is blown, by a blower, into the agitator—conveyors, as we used there.

Q. Do fumes rise from nitric acid, into which are in-

613 troduced the electrodes? A. Yes, sir.

Q. And what is done with the fumes arising?

A. What was the question?

Q. What did you do with the fumes that rise from the nitric acid, into which is introduced the electrodes?

A. It is blown into the flour-agitator, or conveyors, and mixed with the flour.

Q. This gas that rises, is mixed with the flour?

A. Yes, sir.

Q. How far from your agitator was your generator of this gas? A. About four or five feet.

Now, what kind of an agitator have you?

It was wooden conveyors-in wooden boxes. Practically air-tight boxes.

Q. Now, during the time that you employed this bleaching

process, did you bleach all the flour that you made there? A. No. There was some of our customers that didn't want

their flour bleached, and which we never bleached for them. O. Well, what proportion, about of your output did you bleach?

A. Well, at one time we were bleaching probably eighty

per cent of the total output.

Q. Now, what effect does the treatment of the flour, in this agitator, with the gas mixed with the air, have on the color of the flour?

A. Well, it whitened the flour, although it was a dead, flat white, and it did not have the bloom that unbleached flours

have.

Q. Now, as to the amount of whitening, or reduction. Was that affected by the amount of gas employed, either by concentration of the mixture, or by lengthening the time of exposure in the agitator?

A. Yes, sir. It was governed by the amount of gas used. Of course, up to a certain extent. There is a limit that, when that is exceeded, of course, the flour turns yellow again.

Q. That is, the bleaching, or whiteness would increase, as

the amount of gas employed up to a certain point?

A. Yes, sir.

Q. And after that point, the flour turned yellow?

A. Yes, sir. Where it was exposed to extremely hard bleaching, or exposed for several days, the flour would turn yellow, or sulphur color.

Q. Did you have any opportunity to observe the effect of this medium-that is, air and gas mixed which you mingled with your flour, upon iron, either in the agitator,

or leading to it?

A. No sir. We used rubber hose for conducting the gas from the cell to the conveyors.

Q. What kind of a hose was it?

It was a three-ply, best grade rubber hose that I could A. buy. After they had been on about four or five months, they became clogged up inside, and, on examination of it, I found that they had rotted so I could break them in two with my hands.

Q. After four or five months? A. Yes, sir.

Q. Now, did you also have opportunity to see the flour, either in the agitator or your spouts, that was exposed a long time-flour that did not pass along, stopping in angles, or corners, or things of that sort? A. Yes, sir.

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Q. What came over that flour, if anything?

Q. Well, it turned color as I have described. It was sulphur colored, as near as I could describe it.

Q. And the color of ordinary, merchantable sulphur?

A. Yes, sir.

Q. Now, with respect to this gas, was there an [order] to it?

A. Yes, sir.

Q. And, when the agitator was opened, where it was employed, could such odor be detected? A. Yes, sir.

Q. How about the [order] about the mill?

A. Well, it could be detected.

Q. Anywhere in the mill, where you were using it?

A. Well, especially on the floor where the bleacher was used.

Q. Now, how about the packing room where the flour went, after it left the agitator?

A. Well, I never noticed it up there, in the warehouse, after it had been sacked.

Q. But, in the packing room, itself, as it was being sacked?

A. Oh.

Q. And as it came freshly from the agitator.

A. You mean from the packer?

Q. Yes. A. Yes, sir, it was noticeable.

615 Q. But, in sacks, themselves, you never gave that any attention? A. I never detected it.

. Did you make patent flour at that mill?

A. Yes, sir.

Q. And any other kind? A. Yes, sir.

Q. What other kind?

A. Made straight, clear, and low grades.

Q. Did you bleach all?

A. I have bleached all grades, excepting the low grades.

Q. You bleached the patents, straight, and clear?

A. Yes, sir.

Q. What percentage was included in your low grades?

A. From three to five per cent.

Q. So, you bleached from ninety-five to ninety-seven per cent of the yield of the wheat? A. Yes, sir.

Q. What did you call straight flour? What percentage?

A. Well, the total amount of the flour extracted from the wheat, excepting about the three or five per cent, as I mentioned, of low grades.

Q. So, when you ran it all together, ninety-five to ninety-seven per cent of the total yield, you called that straight?

A. Yes, sir.

Q. Was the low grade sold as flour, food for human beings, or was it put into the animal feed,—the bran and shorts?

A. It was sold as food for human beings.

Q. Is that sometimes called the "red dog" or is there in your process a distinction between the low grades and the red dog?

A. Yes, there is a distinction between them. We don't

make the red dog separately.

You don't separate them? A. No sir.

You let that run off with the shorts? A. Yes. Q. You separate your shorts and bran? A. Yes, sir.

And the red dog would be included in the shorts? Q.

Yes, sir. A.

And that, you say, just above the red dog, you sold separately as flour, and sold it unbleached? A. Yes, sir.

That contained impurities, such as bran, and germ and

fluff, and so forth? A. Just the lower grades.

Q. The lower grades? Now, before bleaching, I want to get the relation of colors of your patent, and clear, 616 and straight. Which was the whitest of the three before bleaching? A. The patent.

Next? A. Straight.

Next? A. Clear. Q. Was there much difference in the color, before bleach-Q.

ing? A. Yes, sir.

And, in what step was the greatest difference-between the clear and the straight, or between the straight and the pat-A. Between the clear and the straight. ent?

What percentage of patent? Did it make about the Q.

same percentage all the time? A. Yes, sir.

And what percentage of patent? Q. About eighty per cent-eighty-five.

A. Q. And, of straight?

Do you mean before the bleaching? A. Yes, I mean before the bleaching.

A. Well, we made from about seventy-five to eighty per cent.

Q. Seventy-five to eighty? A. Yes, sir.

Q. And then straight? How much would that be? That would be ninety-five to ninety-seven per cent. A.

Ninety-five to ninety-seven? And the clear would be from twenty to twenty-five? A. Yes, sir.

Or, fifteen to twenty, would it, if you count the low

grade as five? A. Yes, sir.

Q. Counting the low grade as five, the clear would be fif-

teen to twenty? A. Yes, sir.

Q. Now, if you bleached the straight, and compared it with the color of the patent, not bleached, could the straight be made as white as the patent-the straight, bleached, be made as white as the patent, unbleached? A. Yes, sir.

Q. Could the clear, bleached, be made as white as the patent, unbleached? A. Well, hardly.

Q. Could it be made as white as the straight, unbleached?

A. Yes, sir, it could be made very similar.

Q. Bleaching would make the clear, as respects color, look very similar to a straight? A. Yes, sir.

Q. And a straight very similar to a patent?

A. Yes, sir.

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Q. Now, after bleaching, what were your percentages in the bleaching. A. About eighty-five per cent.

O. Patent? A. Yes, sir.

Q. The straight would remain the same? A. Yes, sir.

Q. Or did you increase that?

A. How is that? No.

Q. Did you increase the straight—cut the low grade smaller? A. No, sir.

Q. You left that ninety-five to ninety-seven? And your clear would be ten? That would make ninety-five and five low

grade? A. Yes, sir.

- Q. Now, in case of flour that is made from wheat that is new, that has not been stacked, or permitted to go through the sweat, before or after thrashing—what is the character of that flour, as respects color, and the flour that that same wheat would make, under like conditions, if it had gone through the sweat?
- A. Flour made from the wheat that has not gone through the sweat is darker in color and decidedly so.
- Q. Now, supposing that flour from this new wheat which had not been sweated, had been bleached by this gaseous medium, and appropriately bleached—what would its appearance be, as compared with flour made from the same wheat that had been aged or conditioned by going through the sweat?

A. It would be very similar in color.

Q. The bleaching would make them similar—make them more alike in color? A. Yes, sir.

Q. Now, as respects flour that is freshly milled, as compared with the same flour that has been stored and aged and conditioned for some weeks or months, what is the relation of color?

A. The flour that has been aged is improved in color.

Mr. Smith: I move to strike that out, Your Honor, as incompetent.

Mr. Butler: It may go out.

The Court: Stricken out.

618 By Mr. Butler:

Q. Now, the relation of color—that would be as to likeness?

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A. It would be whiter, flour made from wheat, after it had been aged for several weeks.

Q. Would be lighter than it was when it was freshly milled?

A. Yes, sir.

Q. Now, if the freshly milled flour be bleached appropriately, how will its appearance compare with what it will become in natural aging?

A. It could be made as white, although it would not have

the bloom that the aged flour would have.

Q. It would not be exactly the same in color as aged flour?

A. No. It would be very similar, until one not experienced

would not be able to tell the difference.

Mr. Smith: Well wait. I object to that. I object to his testifying as to what any one would not be able to do. That is conclusion of the witness, incompetent, and improper.

The Court: Objection sustained.

By Mr. Butler:

Q. Have you, yourself, ever had any means of comparing the dough-making qualities of flour, bleached and unbleached?

A. Yes, sir.

Q. Where? In your mill, there? A. Yes, sir.

Q. Have you a laboratory there?

A. Yes, sir, I have Koellner equipment.

Q. That is, K-o-e-l-l-n-e-r; is that the way you spell that?

A. Yes, sir.

Q. Koellner's method? A. Yes, sir.

Q. Now, what effect, if any, has bleaching upon the doughmaking qualities of flour—take the same flour, before you treat it with this gas and air, and after you treat it.

A. Bread made from a bleached flour hasn't got the flavor.

Mr. Smith: Well wait. I object to that, your Honor, as incompetent, under Your Honor's ruling.

619 By Mr. Butler:

Q. Well, has it got the same flavor?

Mr. Smith: He is making comparative tests.

The Court: I suppose he may say whether it is the same flavor.

Mr. Scarritt: We make the same objection.

Mr. Smith: Well, I guess he can, under your Honor's ruling—he can say it wasn't the same. I believe that is Your Honor's ruling.

The Court: Go on, Mr. Witness, and tell us.

A. In fact, it lacks the flavor that the-

Mr. Smith: (Interrupting) Now, I move to strike that out, Your Honor. I object to that. That is an opinion of the witness.

The Court: We will see if it has any flavor, or no flavor. I don't know as there is much difference in this, after all.

By Mr. Butler:

Q. Go on.

A. The flavor is not noticeable, so much.

Q. Of the bleached? A. Yes, sir.

Q. Now of the unbleached? How is it?

A. Well, it is noticeable.

Q. Can you describe it? The taste is very hard to describe, but you must compare it with something else, and every man, would perhaps in degree be a standard for himself, but can you describe the taste of the bread made from the unbleached flour?

A. The bread from the unbleached flour has a nutty flavor-

rich flavor.

Q. Now, bread made from the same flour, after it has been through the agitator, mixing it with this gaseous medium—has that a nutty flavor? A. No, sir.

Q. Now, as to the color of the two breads. Which is

lighter in color, if either one is?

A. The bread from the unbleached flour has more of a yellowish tint, while the bread from the bleached flour is more of a grayish color.

Q. Now, as to the character of the dough, when you are making it under the same conditions, the same flour, 620 before it has been through that agitator, filled with this gas and air, and more of the flour that has been through

it? How about the dough, or the elasticity and toughness, or strength?

A. The dough seems to be weaker, made from a bleached flour, than that made from an unbleached flour.

Q. 'Have you observed anything about the comparative keeping qualities of the two breads, one made from the bleached and the other from the unbleached? A. No sir.

Q. Which molds first, or anything of that kind?

A. No. sir.

Q. Have you observed anything of the changes that come over the same flour, one being bleached and the other being unbleached? You have told us that the unbleached changes and improves in color, and so forth. Now, how about the bleached? Have you observed that?

A. No. I have never been able to detect any difference in

the unbleached, or, rather the bleached flour.

Q. You have never been able to determine any change, on aging-after lapse of time, after bleaching? A. No, sir.

When was it you discontinued bleaching? Q.

A. It was sometime in April, 1909.

And why?

Mr. Smith: Oh, I object to that as immaterial, and irrelevant, as to why.

The Court: What was the situation?

Mr. Smith: He asked the question why he quit bleaching in April, 1909. I objected to that, for the reason that it is immaterial.

The Court: Oh, I think that is immaterial.

By Mr. Butler:

Q. Well, don't answer until I ask the same questions that the other gentlemen have, once or twice. Did the bleached flour give satisfaction to your customers, or were complaints made?

Mr. Smith: I object to that as immaterial.

The Court: Objection sustained.

By Mr. Butler: 621

Q. Now, did you hear the testimony of Mr. Overton Tucker, who was the miller who milled the flour which was seized,-were you in court when he testified?

A. I heard a part of it, yes, sir.

(Recess taken for five minutes.)

Q. Now, assuming that the wheat which was used to make this flour that was seized, was Number 2, Turkey hard wheat, which had mixed with it, from ten to thirty per cent of yellow berry, I will ask you, in your opinion, whether or not that is first quality hard wheat.

No, sir. I don't think it would be considered first quality hard wheat, if it had a mixture of the yellow berry

with it.

Mr. Butler: I think that is all.

## Cross-Examination

By Mr. Smith:

Q. Do they raise any hard wheat in your country?

Yes, sir.

Do you have any of what you call the yellow berry in the wheat down there? A. No, sir, not in our county.

Q. Sir? A. Not in our county, that I have ever seen.

Not in Ellsworth County? A. No, sir.

What is the fact about the wheat that is grown in Ellsworth County? Does an ordinary hard wheat generally contain more or less of what you term yellow berry?

No. There is some of it that has a slight mixture, but

as a general thing, it is strictly hard wheat,

Oh, yes. Well, yellow berry is a hard wheat, isn't it? Q.

A. I understand it is.

Well, don't vou know? O.

A. I never milled it separately.

Q. Did you ever see any vellow berry wheat?

A. Yes, sir.

Mixed in with the turkey-red, isn't it? A. Yes, sir. Q. Q. All grown in the same field, isn't it? A. I suppose.

Grown from the same seed, isn't it? Q.

A. I don't know.

622 Q. Do you know whether or not, if you sowed the turkey-red wheat, of the purest kind, that some of the grains, or some of the heads of wheat that grow from them would contain what you term yellow berry? Do you know that?

A. No. sir.

Q. Well, do you know whether it is true or not, or do you mean you don't know anything about it? A. No, sir.

Well, which is it? Do you know anything about it? I am after your knowledge now.

A. The wheat that is raised through our country-

(Interrupting) No, that isn't my question, now. Do you know whether or not wheat that is grown from turkeyred wheat, whether heads of wheat will or will not, some of them, contain some grains of yellow berry? Do you know that? A. No. sir.

Q. Do you know it is true or not? A. No, sir.

Q. Do you know anything about that? Now, I am after your knowledge-not your supposition, but your knowledge. Do you know anything about it.

The wheat that is raised in our county is strictly hard A.

wheat.

- Q. What is it? A. Is strictly a hard wheat.
- What is? A. That is raised in our vicinity.
- Q. Well, doesn't that hard wheat contain some yellow berry? A. No.
  - Q. None at all? A. No, sir.
- Are you prepared to say that the yellow berry is not a hard wheat? A. I think it is a hard wheat.
  - Q. But you don't raise any of it in your vicinity?
  - A. I understand it is hard, yes.
  - Q. Sir? A. I understand it is hard wheat.

Q. Yes, but do you understand that the wheat that is grown in your vicinity—that, in the hard wheat that is raised there, there is none of the yellow berry in the wheat?

A. No, sir, there is not.

Q. None at all? A. None to speak of.

623 Q. Where did you ever get any yellow-berry wheat?

A. We have had a few cars shipped from Salina to us.

D. Kansas? A. Yes, sir.

Q. You never bought any Nebraska hard wheat?

A. No. sir.

Q. You don't know anything about the wheat that is raised up there? A. No, sir.

Q. Never have seen any of it? A. No, sir.

Q. Now, your mill has a capacity of four hundred barrels a day, you say? A. Yes, sir.

Q. How long has that mill been equipped?

A. It was remodeled about seven years ago.

Q. How many rolls, have you? A. Twelve double stands. Q. How many corrugated rolls? A. Five double stands.

Q. And how many of the smooth?

A. It would be seven double stands, smooth.

Q. Over how many of these rolls do you pass your flour?

A. We have five breaks. It is a five-break mill. Q. When do you begin drawing off patent flour?

A. On our sizing stock.

Mr. Butler: I didn't get that phrase. What was that?

(Last answer read by the reporter)

The Witness: Sizing is the first break.

By Mr. Smith:

Q. How many purifiers do you have? A. Seven.

Q. After your wheat has gone over the first break, do you draw off any of the flour? A. Yes, sir.

Q. What do you call it? A. First-break flour.

Q. Well, but in which of these divisions that you gave Mr. Butler does that go? A. It goes into the clear.

Q. After it goes over the second break, how about it?

A. That goes either to clear or patent.

Q. After it goes over the second break, part of it is patent, is it? A. It can be throwed either to patent or clear.

624 Q. Yes, but you throw it pretty much into the patent, do you? A. Yes, sir.

Q. After it goes over the third break?

A. Sometimes we throw that into the patent.

Q. Sometimes you throw that into the patent.

A Yes, sir.

Q. Well, how does it come you do sometimes, and not at all times? A. Well, it depends upon the quality of the wheat.

Q. Depends upon the patent you are going to make?

A. Of the wheat milled.

Q. Does it depend anything on the per cent of patent you are trying to make? A. Yes, sir.

Q. And you don't make the same per cent of patent all the

time, do you? A. Well, not all the time, no.

Q. Between what per cents does your patent vary?

A. Between seventy-five and eighty-five per cent.

Q. Now? A. How is that?

Q. Now? Are you making some eighty-five per cent patent now? A. Yes, sir.

Q. Aren't you making more than that, now, out of some

wheat? A. No, sir.

Q. Eighty-five per cent is your limit, is it? A. Yes, sir.

Q. But you are now making some eighty-five per cent patent, are you? A. Yes, sir, very little.

Q. Good flour, ain't it. A. How is that?

Q. Good flour, isn't it?

A. Well, it is not patent flour, no. No, it is not patent flour.

Q. Well, you said it was eighty-five per cent patent, did you not? A. It is called patent.

Q. You call it patent, don't you? A. Yes, sir.

Q. Sell it as patent? A. Yes, sir.

Q. Goes out of your mill as patent flour, doesn't it?

A. Yes, sir.

Q. And it is eighty-five per cent of the whole output, isn't it? A. Yes, sir.

625 Q. And yet you say it is not patent flour?
A. It is not middlings of the flour.

Q. I didn't ask you that. Is that patent flour?

A. Patent flour is-

Q. (interrupting) Just answer my question. Is that patent flour? A. No, sir.

Q. You sell it as patent? A. Yes, sir. The sack calls for patent.

Q. As it is branded, it goes out? You say it is branded patent flour, isn't it? A. Yes, sir.

Q. And yet you say it is not patent flour? Is that right?

A. It is not-

Q. Is it patent flour? That is the question. Is it?

A. It isn't middlings flour.

Q. I didn't ask you that. Is it patent flour?

A. Patent flour is made from purified middlings.

Q. Is this made from purified middlings? A. No, sir.

Q. And yet, you brand it as patent, and send it out as such, do you? A. Yes, sir.

Q. Now, when did you put your Williams bleacher in.

A. About two years and a half ago.

Q. And you used it, I believe you said until April, 1909.

A. Yes, sir.

Q. And during that time you said you bleached for those who wanted it? Was that it? Was that what you said?

A. Yes, sir.

Q. Well, how did you ascertain whether they wanted it bleached? Ask them? A. We started to bleach for all of them, but the majority of them objected.

Q. Some of them didn't want it bleached? A. No, sir.

Q. Could they tell whether or not it is bleached?

A. Yes, sir, I think so.

Q. That is easily determined, is it? A. Yes, sir.

Q. Anybody who is at all accustomed to handling flour can tell whether it is bleached or not?

A. Yes, sir, I think so.

Q. So, any of your customers who you sent flour, any customer who is accustomed to handling flour, can tell, by handling it, whether it is bleached or not?

A. I don't know as the customers could? Any person who

is experienced in handling flour.

Q. Yes, sir, any person accustomed to handling flour, they can tell, can't they? A. An expert can, yes, sir.

Q. A man who is accustomed to buying flour, can tell whether it is bleached, can he? A. Yes, sir, I think so.

O. Easily? Easily, can't he? A. I think so.

Q. Now, when you were running your bleacher, you never used anything but the Williams process? A. No, sir.

Q. And when you were running your bleacher, did you

bleach all the grades of flour?

A. All excepting the low grades.

Q. Well, is that what you called the clear, or the red dog?

A. No, sir.

Q. Sir? A. No, sir. It is neither one.

Q. What was it?

A. It is about five per cent of the lower grades, such as Dust and Fluff.

Q. Now, is that what every other miller calls "red dog"?

A. No, I don't think so.

Q. Do you make anything at your mill that you call "red dog"?

A. Some millers call it "red dog" and some shorts.

Q. Yes, that is what I think. You call it flour, don't you?

A. Sir?

Q. You call it your lowest grade of flour?

A. What—red dog? Q. Yes. A. No, sir. Q. What do you call it? A. The red dog?

Q. Yes? A. We call it shorts. It goes with the shorts.

Q. What per cent shorts do you get out of yours?
 A. About—well approximately twenty-five per cent.

Q. When you were making a patent flour, how many grades of flour did you make?

A. Two grades—that is, three, with the low grades.

627 Q. Well, all right. When you were making a patent flour, you drew off a certain per cent of it, and you called it patent, did you? A. Yes, sir.

Q. And, what per cent, now, did you call patent?
A. Well, from seventy-five to eighty-five per cent.
Q. Eighty-five per cent? When did you [being]?

A. Well, we have always done that.

Q. You have always done that, as long as you have run the mill, you have made as high as eighty-five per cent?

A. No. sir. I was thinking of this patent.

- Q. This mill, that is. How long have you been running this mill? A. Six years.
- Q. And, as long as you have been running this mill, you have been making from time to time an eighty-five per cent patent, have you?

A. No, sir, not until the last two or three years.

Q. All right. During the past two or three years, then, and up to the present time, you have been making from time to time, an eighty-five per cent patent, haven't you?

A. Yes, sir.

Q. And, selling it as such? A. Yes, sir.

Q. Now, what per cent, when you are making a patent, do you run into the clear?

A. Well, from ten to fifteen per cent, approximately.

Q. And then you have another grade still?

A. How is that?

Q. Do you have another grade, still, after that, when you are making a patent flour?

A. I should have said from fifteen to twenty.

Q. All right. Do you have another grade after that?

A. Ten to fifteen. That is approximately what it is.

Q. Then, do you have another grade?A. The low grades, clear and patent.

Q. Well your low grade flour, then, you don't call it a clear do you? A. No, sir.

Q. What do you call it? A. We call it low grade, Q. Oh, no—you don't understand what I mean.

628 Mr. Butler: You understand what he means, I think, Mr. Smith.

Mr. Smith: All right. Just restrain yourself, and we will get along.

Q. Well, you are making a patent flour, the first part which you take out, and which you put on the market as a patent flour, you call what-patent? A. Yes, sir.

And the next immediately below that, you call what?

A. Patent.

And you have two? A. The grades, you mean? Q.

Yes. A. Straight flour. Q.

Q. When you are making a patent, do you make straight?

No. sir. A.

Supposing you are running a mill today, and you are drawing off a certain per cent patent. A. Yes, sir,

Next to the patent, you call what? Q.

- When we make patent, we make no other grade-clear A. flour.
  - And do you make a third grade at the same time? Q.

A. No, not at the one time.

Q. If you are running your mill today, and grinding a patent flour, you would put eighty-five per cent of it into it, and call it a patent, wouldn't you? A. We could do that, yes.

Q. And the balance of it, you would call what?

A. Clear.

Q. And that would take all of it, wouldn't it? A. Yes.

So, you have your flour divided into two classes-the patent and the clear, and you put eighty-five per cent of it in the patent, and fifteen per cent of it in the clear? Is that right? A. Sometimes, and sometimes we put seventy-five.

I suppose sometimes you don't always run the same. Now, did you ever bleach this, down here, that you call the

fifteen per cent clear? A. Yes, sir.

What did you call that, when you bleached it? Q.

We called it clear. A.

Q. Still called it clear? Now, if you throwed all the streams into one, you call it straight, don't you? 629 Yes, sir.

And you have bleached that, haven't you? A. Yes, sir.

Now, there is a difference between the color of a patent and the clear, before you bleach them, isn't there?

Yes, sir. A.

That difference is very marked, isn't it? Q.

Yes, sir. A.

Now, anybody can tell that, that has got good eyes, can't Q. A. Yes, sir, I suppose so.

Now, what is the difference in the color? Q.

The patent is whiter than the clear. A.

The clear has specks of bran? Q. No, no bran, but it has not the granulations. It is soft. A.

Q. It is darker colored, isn't it?

A. It is darker colored, yes, sir.

Q. And the granulations, and the parts of the white berry, and the little particles of bran that usually get in there are in what you call the clear, and that is what makes it inferior?

A. There is a little fibre in the clear, yes, sir.

Q. Now, the difference in the color between those, is well defined, isn't it? Anybody can see it? A. Yes, sir.

Q. Now, let us assume you bleached both of those. Isn't the color equally well defined, as it was before, between your patent and your clear? A. Yes, sir, there is—

Q. (interrupting) It makes your patent whiter, doesn't it?

A. Yes, sir.

Q. And it makes your clear whiter? Isn't that true?

A. Yes, sir.

Q. And the difference between them is just as discernible after it was bleached, as it was before, isn't it?

A. Well, I don't know as a fact as it is.

Q. Well, you can readily discover the difference between the patent, after it is bleached, and the clear, after it is bleached? A. Yes, sir.

Q. The difference is very marked, isn't it?

A. Yes, sir.

630 Q. Anybody can see it, can't they? A. Yes, sir.

Q. Now, the color of the flour, after it is bleached, you say is a sort of a dead, didn't you? A. Flat color.

Q. Well, "flat" doesn't describe color to me very well.

A. Well, it is the chalky color.

Q. Now, let us take the patent flour which is bleached.

By Mr. Butler:

Q. What was it you said?

A. The chalky color—the bloom.

By Mr. Smith:

Q. Now, take the patent flour that you make—your eighty-five per center, before you bleach it. What is its color?

- A. Well, it has a bloom—a sort of a very light, creamish tint.
  - Q. All right. Very marked, is it? Well defined?

A. Yes, sir.

- Q. Now, let us take some of that clear flour, and bleach it. What is the color of that?
  - A. Well, it is whiter. It comes up nearer-

Q. (interrupting) Now-

Mr. Butler: (interrupting) Now, wait a minute Mr. Smith.

By Mr. Butler:

Q. You said it came up nearer. What were you going to say?

Mr. Smith: I beg your pardon if I broke in when you were talking.

A. It comes up nearer the patent, by bleaching it.

By Mr. Smith:

Q. Does it have any of that creamy color of the patent?

A. No, sir, not so much so.

Q. Does bleaching give it any of that creamy color?

A. No, sir.

- Q. Gives it more of a dead color, doesn't it? A. Yes, sir.
- Q. Now, the unbleached patent doesn't have any of that dead color, does it? A. Unbleached patent, you say?
  - Q. Yes? Doesn't have any of that dead color, does it? It has a nice, fluffy, creamy color? A. It has the bloom.
- 631 Q. Now, when you bleach the clear, does it give it that clear bloomy color? A. No, sir, doesn't have that.
  - Q. No, sir? Just has sort of a chalky, dead color?

A. Yes, sir.

Q. So, the difference between the unbleached patent and the bleached color would be very well defined, wouldn't it—very observable? A. Not so easy.

Q. Why? Does the unbleached patent have some of that

dead color to it?

A. No, sir, but the clear is whitened so much so—brought up so near the color of the unbleached patent, that [is] is harder to detect the difference.

Q. Well, do you have any trouble about detecting the dif-

ference? A. No, sir.

Q. Do you know of anybody that does?

A. Well, not that I can call to mind, at present.

Q. You don't know of anybody that has any trouble to detect an unbleached patent flour, from a bleached clear, do you? A. I don't think of any one, at present.

Q. No? I guess not. Now, you say you sometimes bleached

your straight flour? A. Yes, sir.

- Q. What is the color of straight flour, before it is bleached?

  A. Well, it is a little bit darker than the patent flour.
- Q. If you take a patent and a straight and a clear, unbleached, would you have three different colors?

A. Yes, sir.

Q. If you took a patent and a straight and a clear, bleached, would you have three colors?

A. You would, but the difference would be so slight that it

is hard to detect.

Q. But you can detect it easily, can't you?

A. I think so.

Q. Well, can't other people detect it as easily as you?

A. I suppose if they are familiar with flour, they could.

Q. Yes? Sure. Now, in the unbleached, either the patent, or the straight, or the clear there is none of this chalky, dead color that you were talking about, is there?

A. How is that?

632 Q. Read it.

(Last question read by the reporter.)

Q. Now, unbleached?

A. No, no, sir. It has the natural color.Q. Just the natural color? A. Yes, sir.

Q. Now, flour that has been freshly milled, and before it has stood in the mill, what is its color? Does it have any of this chalky, dead color?

A. Flour that has stood in the mill?

Q. No, before it has stood in the mill-freshly milled.

A. It is a little darker than flour that has aged.

Q. For a while after, after it has aged, or stood in the mill, for a while, it does not have any of this chalky, dead color?

A. No. sir.

- Q. Then, it doesn't look anything like bleached flour, does it? A. It is whitened.
- Q. Yes, but bleached flour has this chalky, dead color, didn't you say? A. Yes, sir.
- Q. And the unbleached flour, even though it has stood in the mill, don't have any of that chalky, dead color, does it?

A. No, sir.

- Q. So, the distinction between bleached flour and unbleached flour that has stood in the mill, is readily discernible, because one has a chalky, dead color, and the other don't. That is true? A. Yes, sir.
  - Q. You can tell the difference, can you?

A. Yes, sir.

Q. Well, can other people tell as easily as you?

A. Yes, I suppose, if they are experienced.

Q. Yes? So any person who has had experience in handling them, could readily detect the difference between flour that is aged in the mill and the bleached flour, by reason of the fact that one has a chalky, dead color, and the other hasn't? Is that true?

A. I suppose so, yes.

Q. Now, you talked something about some dough and some baking. What do you mean by "nutty flavor"?

Mr. Butler: I didn't hear that, Mr. Smith?

- 633 Mr. Smith: I asked him what he meant by "a nutty flavor." We have heard a good deal about a nutty flavor, and I want to find out what a nutty flavor is.
  - A. It is a nut flavor.
  - Q. That is all you can say about it, is it?

A. As nearly as I can explain it, yes, sir.

Q. Is that the best description you can give of that? Tell the jury. I think we all want to know what you mean by a nutty flavor.

A. Well, it is a rich taste, which is absent in the presence of the bleached flour, or bread made from the bleached flour.

- Q. Do you think if I handed you some bread, here, that you could tell whether it was made out of bleached or unbleached flour?
  - A. I don't know as I could.

Q. What do you think about it?

A. I don't know as I could—it has been a long time since I tasted unbleached flour bread.

Q, Then, wouldn't the taste of bleached flour be so new to you, you could detect it easily?

A. I don't know as to that.

Q. You don't know whether you could or not? You would hate to tackle it, would you?

A. No. I will try it.

Q. All right. We will bring you some bread, here, tomorrow

and have you try it.

Q. Now, in the bread that is made from unbleached flour, you say the color is different from the bread made from bleached flour? A. Yes, sir.

Q. That is readily discernible, is it?

A. Well, there is not such a great difference, although there is a slight difference.

Q. Well, you can tell by looking at bread, whether it is made from bleached or unbleached flour, can't you?

A. I can from them I have baked.

Q. Yes, because you would know before you baked it which was the bleached and which was the unbleached. But,

634 if you bought the bread down here at a restaurant or bakery, could you tell whether it was made from bleached or unbleached flour? A. I think so.

Q. Then the difference is readily observable, is it?

A. Not so readily, no; there is not so much difference but what it is hard to detect the difference.

Q. Is it?

A: The bread from the unbleached has a sort of a yellowish, creamy taste.

Q. Yes, because the one is sort of yellow and creamy?
 A. Yes, sir, while the other has more of a gray color.

Q. Well, the difference between a creamy and a light grey is easily discovered, isn't it?

A. If there is enough to detect.

Q. Well, there is enough difference so you can tell easily is there not?

A. There is, in the flour I have bleached.

Q. Well, if you can tell it, other people can tell it?

A. If it is bleached sufficiently; of course, some bleach harder than others.

Q. Yes, I guess that is right.

A. Where it is slightly bleached it is that much harder to detect the difference.

Q. Coming back to this question of patent flour. Do you know of any standard that has been established by the Government, by the State of Kansas, or by anybody else, fixing a

standard for patent flours.

A. I know of nothing that has been issued by the Government? There was, I believe, about two years ago, or something somewhere along there, a short patent flour meeting that was organized.

Q. Where was that organized?

- A. Well, I belive it was Kansas. In fact, I don't know the details of it.
  - Q. Sort of a short-patent association? A. Yes, sir. Q. You belong to the Short-Patent Association?

A. No. sir.

Q. You belong to the Long-Patent Association, if you make 85 per cent, don't you?

A. Well, if you want to take it that way.

Q. Yes? You never joined the other association, did you?

635 A. No, sir.

Q. Well, cutting out any foolishness, here, you don't know of any rule that has been established by the Government, or any department of the Government, or by the State of Kansas, or any other state, that has attempted to fix a standard of your patent flour, that you can put in the patent flour?

A. No, sir.

- Q. And you never have observed the same rule, from time to time, have you? You don't have an arbitrary rule that you observe, do you? Doesn't it depend upon the quality of the wheat? A. Yes, sir.
  - Q. And the demands of the trade? A. Yes, sir.

Q. Your customers? A. Yes, sir.

Q. And the grade of the wheat? A. Yes, sir.

Q. And depends somewhat on the price, don't it?

A. I suppose.

Q. And you take all those things into account in determining what per cent of your flour you will put into your patent, don't you? A. Some of them, yes, sir.

Q. You generally sell your flour under a guarantee as to satisfaction, don't you? A. All of it.

Q. And that is what regulates the grade and quality, and the market, and that is what controls your color, is the guarantee that goes with it, isn't it? A. Yes, sir.

Q. Do you have your sacks branded straight, clear, patent,

and so on? A. No; we have for patent.

Q. You have patent?

A. Patent on all of them so far as that is concerned.

Q. On all the sacks? A. Yes, sir.

Q. Everything that goes out? A. Yes, sir.

Q. No matter whether it is clear or straight or patent, whatever it is, it is labeled "Patent" is it?

A. Yes, sir. It is the highest patent-

Q. (Interrupting) You have got a highest, and a low patent, and simply patent?

A. There is highest patent, high patent, and patent.

Q. But everything that goes out of your mill is a patent, is it?

A. Yes, sir.

Q. I may ask, are you here taking an immunity bath?

A. Not as I know of.

Mr. Smith: I guess that is all.

The Witness: I will state, though, that we are not the only ones. This is quite general, in Kansas. You will find most of the millers in Kansas have the same thing, so far as that is concerned.

### Redirect Examination

By Mr. Butler:

Q. I intended to ask you, in my direct examination, whether or not this flour which was seized, was labeled "Fancy Patent, This flour is made from first quality hard wheat." Assuming that Mr. Tucker told us the truth, and said that the wheat from which it was made was a hard wheat, containing from ten to thirty per cent yellow-berry, declining to say that it did not contain fifty per cent of yellow-berry; that his yield was a barrel of flour out of every four [barrels] and thirty pounds of wheat, and that ninety per cent of such flour was put in these sacks, so labeled. I will ask you whether, according to your understanding of the meaning of the terms, this wheat flour was, in fact, a "fancy patent flour made from the first quality hard wheat"?

Mr. Scarritt: We object to that as incompetent, irrelevant and immaterial, if your Honor please, and calling for one expert's opinion of another expert's opinion.

Mr. Butler: No, it isn't one expert's opinion of another one.

Mr. Scarritt: And also for the reason that the gentleman has stated, or attempted to state what the witness testified to, and has not stated all the facts.

The Court: Of course, I don't recollect as to Mr. Tucker's testimony.

Mr. Butler: I didn't state all the facts, quite.

Q. (Continuing)—and that his weight was only 59 pounds to the bushel, and that his yield was 42 pounds out of the 59.

Mr. Butler: I didn't quite state that all.

Mr. Scarritt: Well, it is clearly without the rules of evidence, if your Honor please, for one expert to testify as to the opinion of another expert.

Mr. Butler: I didn't ask that.

Mr. Scarritt: It is incompetent, irrelevant and immaterial.

Mr. Butler: I didn't ask Mr. Tucker whether he claimed this was a patent flour. I thought the gentleman on the other side would. I think they did not. I am asking this expert—

The Court: (Interrupting) Just a moment. The state of this record is this: Mr. Butler asked this witness, in his examination in chief, with reference to what different persons could tell about comparisons of flour, how they looked, and all that kind of thing. On Mr. Smith's objection, that was stricken out. Now, the greater part of the cross-examination of Mr. Smith has been along the very line that was ruled out, on objection, with reference to how it looked, what was patent flour, and different grades, and all that kind of thing. This witness was saying what he called patent, and that these millers in Kansas, generally, are branding everything "patent" and so on. I don't see just exactly what the relevancy is, if everyone of these gentlemen of Kansas needs an immunity bath.

Mr. Scarritt: We don't-

The Court: (Interrupting) Just a moment, please, now, Judge.

Mr. Scarritt: I beg your pardon.

The Court: Yes. I failed exactly to see the relevancy of all that, but Mr. Smith has gone into that. I think it is proper re-examination, although I do think we are getting outside the issues here?

638 Mr. Scarritt: Mr. Smith didn't ask him a word about the branding of this flour.

Mr. Butler: Oh, no.

Mr. Scarritt: Or whether it was proper or not, and, besides, if your Honor please, I would like to make this suggestion: There is evidence that may be perfectly objectionable on direct examination, and the character of the evidence not objectionable on cross-examination. We all understand that. But the main proposition is that he is attempting to prove by this gentleman just what the jury has got to decide, and that is, as to the branding of this flour, and he is invading the province of the jury, in getting this gentleman to tell the jury what they ought to decide. He can state the facts, but the conclusion, it seems to me, especially when that conclusion involves one of the vital questions in the case, it is absolutely incompetent for this witness to testify to it.

The Court: Yes, but here: Now, here is the state of the record: I don't care to be commenting on the evidence, but, so far, the evidence has tended very strongly to persuade me that there is no hard and fast rule as to the percentage of any particular part of the kernel of the wheat, that makes patent flour. This witness has said that 85 per cent of many of the brands or grades of wheat, he sent out as patent flours, and thereupon Mr. Smith wanted to know if he was here taking an immunity bath; in other words, if he were here as a criminal.

Mr. Smith: That was after, your Honor, he said he had put 100 per cent of all his flour in.

The Witness: Not 100 per cent.

The Court: Now, just a moment. Don't get excited. Now, what Mr. Smith meant, was "Are you here as a criminal"?—and the witness said that the millers of Kansas generally are doing the same thing, and I haven't yet forgotten, although

it was a week ago, Mr. Smith's opening statement to the jury, here, as to what the evidence was going to 639 be, but which I will not now state, unless it becomes further necessary to illustrate my views, so that, I observed particularly that this gentleman from Nebraska said he was grinding 59 pound wheat. Well, during the days some years ago, when I thought I knew something about that, I pricked my ear up at that,-that is, what kind of wheat they were grinding in Nebraska. So, now, Mr. Butler is stating these facts, and wanted to know. I don't think it is very material, one way or the other, because, if I live long enough to charge this jury, I am going to tell them a good many things, here, that in my judgment, are not material. We have speat a good deal of time for nothing in the world but experience, it seems to me.

Mr. Scarritt: Now, this witness said, if your Honor please that he did not know anything about Nebraska wheat.

The Court: I know, but anybody who knows anything about wheat, knows what a 59 pound wheat is, at least, [at least], I think so. I don't know what they may say about that. All I can recollect is what it is in Louisiana. I don't know what it is in Nebraska. Well, go on. It is immaterial. We have wasted more time, now, than the whole thing is worth.

Mr. Scarritt: What is that?

The Court: We have wasted more time now than the whole thing is worth.

Mr. Scarritt: Well, all I want is a ruling.

The Court: Well, I overruled your objection. I thought you understood that.

Mr. Scarritt: No.

The Court: Yes, quite a while ago.

The Witness: May I make a statement?

The Court: If it is offered in explanation of your testimony, you may. We don't want any speech-making.

The Witness: In regard to the patent flours, I will say that these flours are branded highest patent, straight patent, and clear patent.

The Court: Well, you said that before. There is no use repeating it.

By Mr. Butler:

Q. Now, upon the statement of facts that I have given you, founded on the testimony of Mr. Tucker, as to the kind of wheat that was used here, and the percentage of flour put in, and labeled "Fancy Patent". I will ask you whether or not it is a fancy patent? You told us in your direct examination that in your opinion it was not a flour made of first quality hard wheat.

Mr. Scarritt: Same objection.

The Court: You may answer.

Mr. Scarritt: Exception.

A. I have never seen any wheat equipment that would produce middlings to make 90 per cent patent flour. I consider patent flour flour that is made from purified middlings.

Mr. Smith: Now, I am going to object to this as not responsive to the question. He asked him whether in his opinion it was a fancy patent. Now, that can be answered by yes or no.

By Mr. Butler:

Q. What is patent flour?

Mr. Smith: That wasn't your question at all.

Mr. Butler: It is now.

Mr. Smith: I move to strike out the answer of the witness as not responsive to the question.

The Court: Well, it may be stricken out.

Mr. Butler: Well, that part, "I consider".

The Court: Well, what is patent flour?

The Witness: It is flour made from purified middlings.

By Mr. Butler:

Q. Well, the flour made by Mr. Tucker, as he described it, and as I have heretofore described it, could that much patent be made out of any wheat that you know anything about.

641 Mr. Smith: I object to that.

The Court: Overruled.

Mr. Smith: Exception.

A. No, sir.

By Mr. Butler:

Q. Now, you told Mr. Smith when you started to bleach, you bleached all of it?

A. All of our grades, excepting low grade.

Q. All of your output?

A. I said there was about twenty per cent; that we bleached about 80 per cent of our total output. Some of our customers insisted upon having the unbleached flour, and there was some we never bleached their flour for them at all.

Q. Yes? Then you told them later, a majority of your customers objected to bleaching, I understood you? A. Yes, sir.

Q. And then you quit it altogether? A. How is that? Q. Then, soon after that you quit it altogether, did you?

A. Yes, sir.

Q. Now, Mr. Smith asked you what you could tell and what other people could tell about straight, patent and clear flour. What is the usual and customary method of examining flour, by color? Is it by comparison—the patent with the clear, and the patent with the straight, with the other, or do you look at one today, and the [—], sometime later, either today or

later on, look at another and carry the color in your eye, or must it always be done by comparison made then and there?

Mr. Smith: I object to that as leading and suggestive.

The Court: He may answer.

Mr. Smith: Exception.

A. By comparison, yes, sir.

By Mr. Butler.

Q. How about the comparison made by Mr. Ballard, here in the presence of the jury?

642 Mr. Smith: I object to that.

The Court: Objection overruled.

A. That was one method and another method is dipping the flour in water, which will make it show up more plainly, than in the dust. That is the ordinary manner.

By Mr. Butler:

Q. Now, to many of Mr. Smith's questions, you said, with respect to color, this bleached flour might be detected by you, or anyone familiar with the color of the flour, and accustomed to buying and selling and handling flour; how about housewives and consumers, without any standard of comparison, just having presented the one. What do you say in regard to that?

Mr. Smith: I object to that, no proper foundation having been laid it not being shown that he knows anything about what housewives can do.

The Court: Oh, you asked him several times couldn't anybody tell, and couldn't anybody tell, and so on, Mr. Smith. You may answer.

A. I think no one excepting an expert would be able to determine.

By Mr. Butler:

Q. Would they need a basis of comparison, or could they tell, without by looking at the flour under examination, alone, without comparing it with anything else?

A. I think not, no, sir.

Q. So that even an expert would require a basis of comparison? A. Yes, sir.

Q. You think an expert could not do it without a standard to compare to? A. I would not think so.

Q. Now, about tasting and detecting difference in taste. You were cross examined on that subject. Taste of the bread, from the bleached and the unbleached. Were the tastes com-

pared about the same time, first tasting one and then tasting the other, and then determining the difference?

A. Yes, sir.

643 Mr. Butler: That is all.

The Court: Call the next witness.

(Witness excused.)

Harry Gifford, called as a witness on behalf of the Government, being first duly sworn, testified as follows:

#### **Direct Examination**

By Mr. Butler:

Q. Your first name? A. Harry Gifford.

Q. Where do you live? A. Aberdeen, South Dakota.

Q. You are a miller? A. Yes, sir.

Q. Have been, all your working life? A. Yes, sir. Q. What company are you connected with?

Q. What company are you A. The Aberdeen Mill Co.

Q. And how long have you been connected with them?

A. About twelve years.

Q. Are you the head miller there? A. Yes, sir.

Q. And before that, where did you work?

A. I went from Sheldon, Iowa, to Aberdeen and previous

to that I worked in Minneapolis.

Q. Is this mill that you are working for now engaged in bleaching its flour with the fumes of nitrogen peroxide, mixed with air? A. Not at the present time.

O. Has it ever been engaged in that business?

A. Yes, sir.

Q. When did it commence? Were you there when it commenced? A. Yes, sir.

Q. And when did it quit?

A. It quit on January 14th, 99, I think it was. It was our idea—I will have to explain a little—

Mr. Smith: (interrupting) No, we are not talking about our ideas. Fix the date.

By Mr. Butler:

Q. Well, fix the date.

A. I want to fix the date, so we will not make any mistakes. We stopped bleaching for the purpose of—

Mr. Smith (interrupting): No, I object to this, as wholly immaterial.

The Court: Oh, yes. Why you quit bleaching is not regarded as legitimate evidence.

By Mr. Butler:

Q. Well, by what do you fix the date? You said 99. You mean 1909, don't you, about a year and a half ago?

A. Yes, sir.

Q. Now, how long had you been bleaching?

A. Oh, I should think about five years.

Q. Did you install the bleacher in that mill.

A. Yes, sir.

Q. What particular type bleacher did you install?

A. Williams.

Q. The Williams? A. Yes, sir.

Q. Before installing that bleacher, or since you installed it, did you examine the bleaching process that bleached this flour, which was needed, called the Alsop Process?

A. Yes, sir.

Q. Did you visit mills, and see the Alsop bleacher in process? A. I did.

Q. Where?

- A. Well, at Minneapolis, and then I seen one in North Dakota.
  - Q. And you studied the workings of it? A. I did.
- Q. And finally you bought a Williams? A. Yes, sir.
  Q. That is the same type bleacher that was described by the last witness? A. Yes, sir.
- Mr. Scarritt: I object to this, commencing on other witnesses' testimony if your Honor please.
  - Mr. Butler: Well, I wanted to make it clear, without having to describe it over again.
- 645 Mr. Scarritt: Well, you don't have to describe it over again he can tell what he knows,

Mr. Butler: Well, I asked him whether he knows if it was the same kind of a bleacher that was described by the last witness. Now, that is the way to find out what he knows.

A. Yes.

Q. Now, did you, yourself, have opportunity to observe the effect of this bleaching process had upon wheat flour?

A. Yes, sir.

Q. How far from the shaver—the agitator, did you have your gas producer—this nitric acid with the electrode?

A. About three feet.

Q. How were they connected?

A. They were connected with a rubber hose, from the cell to a conveyor.

Q. Did you have opportunity to observe the effect of this gas, mixed with air, upon any metallic or iron substance, in the agitator, or leading to it? A. Yes, sir.

Q. What were they?

A. We had an aluminum. To connect the hose with the conveyor, we had a jar, and this had an aluminum attachment on there, screwed on, and screwed off, that—the acid in it cut that out, and the aluminum spout, you know, where the holes run down like this (indicating).

Q. Did you observe any effect upon the rubber of your hose?

A. Yes, sir.

Q. What was that?

A. Wear out an ordinary hose in about a week or ten days.

Q. And when you say an ordinary hose, you mean a hose of what strength? A. Oh, just an ordinary garden hose.

Q. A week or ten days? A. A week or ten days.

Q. Did you notice any accumulation of any substance, as the product of the fumes of the air passed from the hose into the agitator?

A. Yes. The rubber, apparently, was eaten up by the acid, and made a sort of yellowish, crumbling, ashy

effect, you know-burned up, is what it was.

Q. What arrangement was there for controlling the strength of the fumes, or the fume dilution?

A. We [—] a rheostat, out of lamps, and, if we wanted to make a stronger gas, we turned in an ampere, or a half an ampere—put in another lamp.

Q. How did you control the flow of atmosphere from the

fumes that mixed with the flour?

A. We had a fan that was connected with this jar with a pipe, drawing from the outside, and I had a valve, that I would

open or close, to give it the air.

Q. Now, have you, in the use of this bleached flour, observed the difference in effect upon flour, resulting in the diminishing or increasing the volume of atmosphere that was brought into the fumes, to go into the wheat flour? A. Yes, sir.

Q. What was the condition, in that regard?

A. Well, the more air you put in, the more it weakened the gas, and it wouldn't have so strong an effect in bleaching it—didn't show it so plain in the bleaching.

Q. Didn't bleach the flour, if diluted with air?
 A. Diluted with air made a weaker solution.

Q. What effect upon the color of wheat flour did it have?

A. Made it white.

Q. Did you make different kinds of flour there?

A. Yes, sir. Q. What?

A. We made a patent, clear, a second clear and a red dog.

Q. Patent, first clear, and second clear, and red dog?

A. Yes, sir.

Q. Did you sell the red dog for flour for human consumption? A. Yes, sir.

Q. All four kinds then you sold for human consumption?

A. The whole four.

647 Q. Now, unbleached? What would be the relative color of those four grades?

A. Well, what we northern millers call a creamy, white,

unbleached.

- Q. And which would be lighter,—would that creamy, white, attach to all grades—the patent, first clear, second clear and red dog?
- A. No, the first patent would have a more creamy color than any of the rest.

Q. Did you make more than one patent? A. No, sir.

- Q. Did you have different kinds of patents—first and second on your labels? A. No, sir.
- Q. Now, which is lighter, the patent, first clear, second clear, and the red dog, of course, is not white at all is it?
- A. No. That is a fibrous stuff, that is not white. The patent is somewhat lighter, not so very much, either.
- Q. Did you make any straight flour there? Mix it all together?
- A. Yes, sir. Our straight flour is made by putting our first clear and our patent together.
- Q. Now, did you change your percentages at all after you began to bleach?
- A. I did. My first clear; that would also change your second clear. My patent flour, I did not.
- Q. You changed the percentages as between the clear, but you maintained the percentage of your patent?

A. Yes, sir.

Q. Have you any objection to telling us what that was?

A. The patent percentage?Q. Yes, sir. A. No, sir.

Q. What was it?

- A. We make from 75 to 80 per cent of first patent.
- Q. And the red, divided between the clear? A. Yes, sir.
  Q. Now, before you bleached, how much per cent did yo
- Q. Now, before you bleached, how much per cent did you put in the first clear?

A. Oh, somewhere in the neighborhood of from 18 to 20.
 648 Q. And in the second clear?

A. Well, now, I will have to figure a little on that, so I won't get mixed. Not that I wish to dodge the issue, at all, but the two—the low grades are the red dog and the second clear, and were about eight per cent.

Q. Each, or together?

A. No, together. So that you would have to take eight per cent off that clear. Of course, that is jockeyed, you understand, back and forth according to the wheat.

Mr. Scarritt: That is what?

Mr. Butler: Jockeyed back and forth.

The Witness: Maybe, perhaps, that is not the proper phrase.

The Court: Everybody here knows what that means.

A Juror: I don't.

By Mr. Butler:

Q. Now, how much percentage did you increase the first clear after you began to bleach? A. From three to five.

Q. Is there a difference in price between patent and first clear? A. Yes, sir.

Q. Between first clear and second clear? A. Yes, sir.

Q. How much is the spread, between the first clear and the second clear, usually?

Mr. Smith: I object to that as incompetent.

The Court: Oh, I think so. Objection sustained.

By Mr. Butler:

Q. Now, as to the effect of bleaching. Suppose you bleached the first clear, and left your patent unbleached. What would be the effect upon the relative appearance?

A. The first clear would look better than the patent.

Q. When you say "look better" what do you mean?

A. Better color.

Q. And when you say "better color" what color do you mean? A. Well, whiter.

Q. It would look whiter? A bleached first clear would be whiter than the patent? A. Yes, in my opinion.

Q. What about the second clear, such as you made after you commenced to bleach, as compared with the patent—a bleached, second clear and the patent, unbleached?

A. Well, there isn't any comparison. That is going down so close to the tail end, it has got so much fiber in it that

bleaching doesn't make much difference.

Q. That is, after you make a 75 to 80 per cent patent, and 80 to 20 per cent clear, you have a second clear that is beginning to look a little ragged?

A. Yes, sir, more like red dog.

Q. Did you bleach it and mark it and sell it as flour?

A. Yes, sir.

Q. Now, with respect to the degree of bleaching, to effect the bleaching of the patent flour. Would it require as much or more of the bleaching reagent than it would to effect the bleaching of the second clear, we will say—the other extreme?

A. Oh, I think about the same relative amount would take about the same amount, for the same amount of flour.

Q. Now, as you bleached them all, would the colors be in the same relation, or would they be nearer together?

A. The third clear patent would be nearer together.

- Q. Now, as to the color of flour made from new wheat, that has not been sweat. How does that compare with the color of flour, made from the same wheat, that has been through the sweat and conditioned?
- A. Oh, the conditioned wheat improves and makes a whiter flour.
  - Q. And as to the quality of the flour?

A. Oh, it is better all around.

Q. It is a whiter and better flour, if it is made from the wheat that has been through the sweat? A. Yes, sir.

Q. Now, suppose, in the case of flour made from the 650 new wheat that had not been through the sweat, that was bleached—how would its appearance be, as compared with flour from the same wheat that had been through the sweat?

A. Well, the flour, bleached, and new wheat, looks as good as wheat that had been aged,—well, consederable better. It was bleached flour—white.

Q. Now, let us take the case of flour that is made from conditioned wheat, well adapted, and well conditioned for milling, to freshly milled flour. How does that compare, in color and strength and quality, with the same flour, after it has been aged and conditioned for a time, by storing, and the like?

A. Well, the aged and conditioned flour is superior in color

and bread making qualities.

Q. When you say "superior in color", what do you mean?

A. Whiter.

Q. Whiter? A. Yes, sir.

- Q. Now, suppose such fresh flour were subjected to this bleaching process, what would its appearance be, as compared with the appearance of the same flour, if it had naturally aged and conditioned?
  - A. I should say about the same.
  - Q. It would look about the same?

A. About the same.

Q. Do you know Mr. Tucker? A. Yes, sir.

- Q. And have known him a long time? A. Yes, sir.Q. You heard his testimony here? A. Yes, sir.
- Q. He formerly milled at Minneapolis, where you did?

A. Yes, sir. Not in the same mill.

Q. No, but in the same town. A. Yes, sir.

Q. You heard him describe this flour—the manner in which

he made it? A. Yes, sir.

Q. Assuming that he testified correctly about that, I will ask you whether or not, in your opinion, the flour seized was really a fancy patent flour, made of first quality hard wheat?

651 Mr. Smith: I object to that as incompetent, irrelevant and immaterial, no proper foundation having been laid, the witness not having shown himself to be at all competent to testify as to conditions in Nebraska.

Mr. Butler: Well, perhaps the Nebraska wheat situation may be unknown to him, so I will limit the question to whether or not, in fact and truth, it was a fancy patent flour.

Mr. Smith: Same object to that.

The Court: You may answer.

A. No, sir.

By Mr. Butler:

Q. Do you have a baking plant, or laboratory, in your mill?

A. Yes, sir, the Koellner.

Q. And did you bake the flours there, before bleaching and after bleaching, from the same flour? A. Yes, sir.

Q. And under like conditions?

A. Yes, sir.

Q. Now, tell the jury what effect the bleaching had on the flour, as a result of your experience, and upon its quality for bread making, the quality of the dough, and the flavor, and

odor, and volume, and everything affecting it.

A. Well, you take the unbleached flour, and it is what we northern millers call the creamy white. It maintains that, from the dust to the bread. The unbleached, that is the unbleached flour, you understand. But the bleached flour loses a certain per cent of this creamy color, and makes whiter bread than the unbleached. That is, in regard to color. In regard to texture—I never was able to see any particular difference between the two textures. The taste was a little different, and, before going into your bread, the dough of an unbleached flour is very elastic—what we call, when we dough, it comes back, good and strong. After bleaching the same flour, it is more of a pie crust—in other words, the dough will break easier. If you stretch out your dough, it will break

easier than the other, showing that something has de-652 stroyed the strength of the flour? The bleaching agent

has ruined the strength, to a certain extent.

Mr. Scarritt: We ask to have that stricken out.

Mr. Butler: What was that, Judge? My attention was called to another matter.

Mr. Scarritt: His argument, telling that it showed that the bleaching reagent had destroyed the strength.

The Court: Yes, that may be stricken out.

By Mr. Butler:

Q. Well, the bleached flour was not so strong? A. No.

Mr. Scarritt: Well, he has stated that, Mr. Butler.

By Mr. Butler:

Q. And, were the flours the same, the only difference being one was bleached and the other unbleached?

A. Yes, sir.

Q. Baked under like conditions?

A. Under like conditions.

Q. Now, you said the taste of the bread was slightly different. Can you describe that more definitely, by stating as to how one tasted and then how the other tasted?

A. Well, there was, you might say, a lack of taste in the bleached one.

Q. Now, as respects the odor or aroma, if there is such a thing, is there any difference?

A. I don't know as I-

Q. The odor, or aroma, or smell of a loaf, recently cut is there any difference in the taste of a bleached and unbleached, or did you observe that?

A. I never observed that.

Q. Now, did you become familiar with the odor attending the use of the Alsop process,—the odor about the mill of the gaseous medium and the like?

A. Yes, I did.

Q. I mean, in your visits to other mills where the Alsop process was being used? A. Yes, sir,

Q. And you, of course, became familiar with the odor about your own mill? A. Yes, sir.

Q. And what do you say about that?

A. I think they were so near alike you couldn't detect them.

Q. So near alike you couldn't detect any difference?

A. Couldn't detect any difference.

Q. Now, did you observe any flour that was exposed for a considerable length of time, to this bleaching medium—any flour in the angles, or corners or spouts in your conveyers?

A. Yes, sir.

What effect did the bleaching medium [—] upon it?

A. It turned them a kind of orange color, I should say—a real yellow.

Q. Did you have any experience with that flour that was over bleached? A. Yes.

Q. What was that? What observations did you make of

that?

A. Well, there was a loaf of bread on my own table that had apparently a streak running through the bread, about the size of an ordinary lead pencil. It looked as if it was raw—failed to bake. I asked my wife if she had—

Mr. Smith (interrupting): Wait; we object to the conversation with your wife.

By Mr. Butler:

Q. Yes. Your attention was called to it, and you talked with your wife about it? A. Yes, sir.

Q. That would not be material.

Mr. Scarritt: I object to the whole thing. That would not have anything to do with this case.

Mr. Butler: It shows the effect of NO2 upon the flour.

Mr. Scarritt: One loaf of bread?

Mr. Butler: Oh, no-

Mr. Scarritt: One loaf of bread, taken from receptacles with all this dust, and rust, as they call it and take and put it on the stove, and bake it? I don't know anything about the cook. Might have been a string or a lead pencil he was talking about.

Mr. Butler: My recollection is, Judge that he has had a much wider range of observation on that subject, but that this was the occasion that set his thoughts in motion.

Mr. Scarritt: When we get to that, we will-

Mr. Butler: (Interrupting) Object again?

Mr. Scarritt: Yes, sir, and it certainly will be proper.

The Court: I will sustain the objection,

By Mr. Butler:

Q. Have you observed the effect of overbleaching or long exposure of the flour to this bleaching medium, upon the breadmaking qualities of the flour so exposed?

A. Yes, sir.

Q. What have been your experiences—in many instances, several, or only a few? Now, I want to get the range of it first now. A. Quite a few.

Mr. Scarritt: I object to that because there is no testimony in this case, and I apprehend there will be none, that that flour

that he is talking about has been used for making bread, or for any other purpose.

By Mr. Butler:

Q. Did you see such flour made into bread?

A. Yes, sir, I did.

Q. Did you, yourself, make it into bread? A. Yes, sir. Q. And you observed it after you had made it into bread?

A. Yes, sir,

- Q. And before? A. Yes, sir.
- Q. And it was flour that was made yellow by this process?

A. Yes, sir.

Mr. Scarritt: You mean the flour taken out of these receptacles and places?

Mr. Butler: Yes, where the gas was.

655 The Court: He may answer.

Mr. Scarritt: Save an exception.

A. The flour that had the streak, called my attention to this, and I baked, out of an ordinary sack of flour, with this same baking, and I still found this streak. I took 339 grams of flour, and one gram of this overbleached stuff; mixed it thoroughly, put it through the same fomentation that I did any dough, and I found this yellow streak there, as I had in the commercial bread.

Q. Where? In the bread? A. Yes, sir.

- Q. Now, describe the appearance of it, and the color of it, and whether you tasted and smelled that, and so on.
  - A. You mean the size of the-

Q. Of the streak.

A. Well, it seemed to gather down in the loaf, as you would roll it; it would be at the bottom, and it was about the size of a lead pencil. That is as nearly as I can describe it.

Q. And you say that occurred in quite a few instances?

A. Yes, sir.

Q. Did you repeat the experiment? A. I did.

Q. And like results each time? A. Like results.

Q. Now, did you try to taste that substance that you described as the streak.

A. No, sir; not after I had put in the "dope" I didn't taste that.

Q. And when you say you put in the "dope" you mean this gram of overbleached flour? A. Yes, sir.

Q. Now, in the use of the bleaching process about mills, you may tell us whether or not there is a liability of more or less flour to be exposed for a considerable length of time, and thus become overbleached to the extent and in the manner that

these particular samples which you used in these particular experiments were bleached?

Mr. Scarritt: I object to this as incompetent, irrelevant and immaterial, not a matter of expert testimony.

The Court: I think so. Objection sustained,

Mr. Butler: It isn't expert opinion, it is merely-

656 The Court: Objection sustained.

Mr. Butler: All right. That is all.

### Cross-Examination

By Mr. Smith:

Q. Have you had any experience with Nebraska wheat?

A. Not very much.

- Q. Have you had experience in the year 1910 with Nebraska wheat? A. No, sir.
  - Q. Or of any of the 1909 crop of wheat? A. No, str.

Q. Where do you get your wheat?

A. It is raised in South Dakota and North Dakota.

Q. What kind of wheat is that?

A. Well, it is known as hard, spring wheat.

Q. Spring wheat, is it? A. Yes, sir.
Q. Not a winter wheat? A. No. sir.

Q. It is known as hard, spring wheat? A. Yes, sir.

Q. Now, as a matter of fact, that wheat, when you grind that makes a very fine grade of flour?

A. Yes, sir. It is known as white, creamy flour.

Q. A little bit whiter than the flour that is made from the winter wheat of Kansas and Nebraska, and this section of the country down here? A. I can't speak as to that,

Q. Did you ever see flour made from the winter wheat of Kansas and Nebraska, or this part of Missouri, before the flour

was bleached. A. Yes.

Q. Well, your flour is lighter than that?

A. No, I never compared them.

Q. Well, as a practical miller, without having the samples side by side, don't you know it is?

A. I wouldn't like to say.

Q. You wouldn't like to say it isn't?

A. I wouldn't like to say, one way or the other.

Q. Now, in your four grades of flour, you include what millers generally term "Red Dog", don't you? A. Yes, sir.

Q. You put that out as a flour? A. Yes, sir.

657 Q. And, in figuring your percentages, you got an 80 per cent patent, figuring on the basis of the Red Deg being flour, haven't you? A. Yes, sir.

Q. So, if you didn't regard Red Dog as flour, and simply figured your percentages on other flours, you would have a higher per cent of patent, wouldn't you?

A. You mean by figuring-cutting the Red Dog out?

Q. Yes, cutting the Red Dog out, and not calling it as flour, but just call your patent and clears as flours, then figure your percentage on them. Your patent would be more than 80 per cent, wouldn't it?

A. I wouldn't think so. Not that way.

Q. Well, you figure your patent as 80 per cent, and that means 80 per cent of your entire output? A. Yes, sir.

Q. And, included in that, is your Red Dog, isn't it?

A. Yes, sir.

Q. Now, if you cut out your Red Dog, and figure your percentage of the other output, it would be higher, wouldn't it?

[Q.] Well, one or two per cent, maybe.

Q. Well, do millers in South Dakota generally figure Red Dog as flour? A. I don't know as to that.

Q. You do, though? A. Yes, sir.

Q. How do you brand that, when you put it out? Do you brand it Red Dog? A. It is not branded, at all.

Q. Why not? A. It is simply sold by sample.
Q. Do you brand your other flours? A. Yes, sir,

- Q. What have you on your bags in which you put your patent flours for instance?
- A. My recollection is there is nothing on there, in regard to patent, at the present time.

Q. Since when?

- A. I don't know as there ever was. I couldn't say, positively,
- Q. What is the brand that is on there? What is on the sack? A. "Snow White" is our home brand.

The Court: "Snow White?"

058 The Witness: Yes, sir.

By Mr. Smith:

Q. And that "Snow White" takes in 80 per cent of the flour?

A. 75 to 80.

- Q. Now, can you tell this jury whether or not any of the bags you send out have the word "patent" on them?
- A. No, I couldn't. I don't know as they ever had. They may have it now.

Q. How long since you came from the mill?

- A. Oh, I have been down here about 7 or 8 days.
- Q. Have you been working there right along?

A. Yes, sir.

Q. And you can't tell whether the word "Patent" appears on any of the bags, or not? A. No, I can't.

Q. You see it there all the time, don't you?

A. Yes, but if I see "Snow White" on there, I know what that means.

Q. How do you label your second grade?

A. Our second grade is known as "Ermine."

The Court: What?

A. "Ermine."

The Court: E-r-m-i-n-e?

A. Yes sir. Understand that is not our clear.

### By Mr. Smith:

Q. What is that? A. The clear is "Hiawatha."

Q. What is "Ermine"?

A. The "Ermine" is the clear and the patent mixed together.

Q. What is your first clear called? A. "Hiawatha."
Q. Do you label it as a clear flour? A. I couldn't say.

Q. Are you quite sure the word "Patent" doesn't appear on that bag? A. The word "patent" I am positive doesn't.

Q. What do you call your second clear? A. "Eureka."

Q. And what do you call your Red Dog?

Mr. Butler: You don't brand it, at all?

A. Don't brand it, at all.

### By Mr. Smith:

Q. What do you call it?

A. Marked with the letter "M" to distinguish it from the feed.

659 Q. When that goes onto the market, contained in flour sacks, there is no brand on there, at all—just "M"?

A. Yes.

Q. But you do sell it as flour,—by sample? A. Yes.

Q. Now, when you ran that bleacher, there, you ran the Williams, did you? A. Yes, sir.

Q. And how many years did you run it?

A. I think between four and five. I am not positive.

Q. Now, when you were running it, you bleached your patent? A. Yes, sir.

Q. Straight? A. Yes, sir.

Q. Clear? A. Yes, sir.

Q. First clear and second clear? A. Yes, sir.

Q. And your Red Dog? A. No, sir.

Q. You bleached everything except the Red Dog?

A. Yes, sir.

Q. Now, I think you said that, on the low grade flours, bleaching—what was your evidence in regard to that—what was the effect of bleaching, on low grade flours?

A. Well, like our second clear, it hadn't the desired effect. The fiber was there, and it didn't make as good impression as it did on the other grade.

Q. As a matter of fact, it magnified the fiber, and made it

look worse, didn't it?

A. No, I don't think it made it look worse. It looked bad, before.

Q. It didn't help it? A. No, sir.

Q. Now, in this low grade flour. Now, you spoke of that flour as flour on which the bleaching agent didn't have any effect. A. I did, but it whitened it, some.

Q. Oh,—it bleached the fiber?A. No. I don't think it did.

Q. It bleached the flour particles, in it, didn't it?

A. In general appearance, it made it a little whiter.

Q. But the impurities, or the fiber that was in there, were particularly discernible, after you bleached it?

A. I don't think any more so than before,

Q. Well, they were readily discernible, before? A. Yes, sir.

660 Q. And you found that bleaching the low grade didn't help it any, didn't you? A. It helped it a little.

Q. But you discontinued it, because you found it wasn't coming up to what you wanted it?

A. Oh, I never discontinued it, on that,

The Court: On what?

A. On the second clear. I never bleached the Red Dog, but I did the second clear. I never discontinued that.

The Court: You mean you are still using it?

A. Oh, no-until I quit the business.

Mr. Butler: Until he quit the whole business, in 1909, sometime,

# By Mr. Smith:

Q. Now, when you used the bleacher there, in your mill, when you manufactured a patent, and a clear, and a straight, we will say, now there was a marked, discernible difference in the color of those three, wasn't there, before they were bleachd?

A. Yes, Yes, there was a difference,

Q. Now, what was the color of the patent, then, when it was unbleached? A. Sort of creamy white.

Q. Now, when you bleached the first clear, or the straight, what was its color? Did it then become a creamy white?

A. Yes.

Q. Did you get the cream color on that?

A. It didn't destroy the cream, altogether,—unbleached.

Q. What effect did it have, then?

A: It made it a better looker. Looked a little better,

Q. Bleaching made it look a little better, did it?

A. Yes, sir.

Q. Now, what effect did it have, when you bleached the patent? Make it look a little better? A. Improved it.

Q. Can you readily distinguish the color in the patent, be-

fore and after it was bleached? A. Well, yes.

Q. That difference was marked, was it? A. Not much.

Q. The patent was pretty white, before it was bleached, wasn't it? A. Pretty white, yes.

Q. And you didn't need much whitening?

A. I used a very small amount.

Q. Now, the first clear after that was bleached—was there much difference in its color, and before it was bleached?

A. Quite perceptible. It was considerable whiter.

Q. Anybody could discover that difference, could they?

A. Oh, yes. Yes.

Q. So that any person, by looking at that could tell whether or not it was bleached, couldn't they?

A. They could tell that one was whiter than the other.

They couldn't tell whether it was bleached or not.

Q. But they could see the difference in color? They might not know what caused it, but they could see the difference, and see that they didn't have the same grades of flour?

A. Yes.

Q. And when the patent was unbleached, and when the clear was bleached, could you see a difference, there, in color?

A. Yes, sir.

Q. Plainly? A. Yes, in favor of the clear.

Q. The clear was whiter? A. Yes.

Q. But, if you put the two flours together, you could see there was a marked difference between them, couldn't you?

A. Unbleached patent and the unbleached clears.

Q. They didn't look alike? A. No, sir.

Q. So that a person looking at the two would readily see you had two kinds of flour, there, wouldn't they?

A. Yes, sir.

Q. So, if you passed them both up to a customer, the one patent, unbleached, and the clear, bleached, he would see they were not the same kind of flour, wouldn't he? A. Yes, sir.

Q. He might not know what was the difference—what caused the difference—that is, whether it was in the material, or bleaching, or what,—but he would readily see that he had two different grades or two different looking flours, wouldn't

he? A. Yes, he would choose the clear.

662 Mr. Butler: What is the answer?

A. He would choose the clear.

By Mr. Smith:

Q. He would choose the clear, if he wanted a white flour?

A. Yes.

Q. And if he didn't, he would choose the other?

A. Yes, sir.

Q. But what I am trying to get at,—a person looking at the two, could see there was a marked distinction between them?

A. Yes, sir.

- Q. And then if he preferred the white one, he would take one, and if he preferred a yellow, he would take the other, would he? A. Yes.
- Q. And that was true and the second clear, when you bleached it? A. Not so strong.
  - Q. The second clear didn't respond as well as the other?

A. Didn't respond.

Q. The fact of the business is, the higher the grade of the flour, the better that does the bleaching? Isn't that it.

A. Yes, sir.

- Q. And the lower the grade of the flour, the less good it does to bleach it? A. Yes, sir.
- Q. So, when you get down to the Red Dog, it wasn't much good bleaching it, at all? Did you ever try to bleach that?

A. No. It wasn't worth trying.

Q. Now, in your baking tests, where you found this streak like a lead pencil. There, you got some flour that had been standing there in some crevice or part of the mill for a long time, and had been overbleached, as you term it.

A. It was overbleached, yes.

Q. Do you know how long it had been there?

- A. I aimed to clean out those spouts and all connected with the bleachers, once a week.
- A. Now, if you got flour from any place where it has 663 stood until it becomes sort of mildewed, or damaged, in that way, it would show up in the bread that way, wouldn't it? Show up bad?

A. It wouldn't show up like that.

Q. It wouldn't show up bad but it would show up in the bread, wouldn't it?

A. I suppose it would-mildew. I never tried that,

- Q. Now, in making these bread tests, what do you mean by the texture?
- A. Why the woven—the foaf, that is close together. It isn't so full of holes,
  - Q. Yes, I see what you mean. It is kind of porous?

A. Yes, sir.

Q. Now, as to that porous texture. I believe you said you couldn't discover any difference between them?

A. No, sir.

Q. Couldn't notice any difference? A. No, sir.

Q. Could you notice any difference in the size of the loaf?

A. Yes. The volume of the unbleached a trifle over. We got a larger volume from unbleached flour, than we did from the bleached.

Q. Did you ever weigh them? A. Yes.

Q. Which weighed the most?

A. The weight seemed to be a trifle in favor of the unbleached flour.

Q. Was that because it took up more moisture?

A. I think because it retained more.

Q. But, as to the texture, you wouldn't be able to discover any difference? A. No, sir.

Q. As to volume of loaf, you thought it was a little in favor of the bleached? A. No, the unbleached.

Q. Unbleached? In the volume of the loaf. I am not talking about weight. I am talking about volume. Did you measure the two? A. Yes, sir.

Q. Now, which did you find the smaller?

A. The unbleached was the larger loaf.

Q. I thought, in your former testimony, you said the other way?

Mr. Butler: I didn't so understand it.

The Witness: If I did, I meant the other way. It was a mistake.

By Mr. Smith:

Q. Because of the amount of moisture that the different loaves would retain, you think that the unbleached retained a little more moisture? A. Yes, sir.

Q. Now, in making these, did you accurately measure the

amount of the flour put in the bread?

A. I measured that in c. c.

Q. Well, I suppose that is good. I don't know what that is. How many times did you make this test, on baking the comparative flours?

A. I made those from two to three times a week.

Q. You baked from both the bleached and unbleached, two or three times a week? A. Oh, no.

Q. That is what I am talking about.

A. Oh, no. Oh, I made that—I suppose I made that test possibly 25 or 30 times, during all that time.

Q. Now, have you got any figures with you, so you can give me the comparative weight of the loaves in each instance.

A. No. sir.

Q. Nor the volume measuring them?

A. No, sir, I haven't.

Q. Did you weigh them accurately, on scales, or is this your own judgment?

A. No, I weighed them.

Q. Can you give me the weight of any of them?

A. No, sir.

Q. Did you measure them accurately, as to volume, or is

that your judgment with your eye?

A. No, that is actual measurement. We put them in a box, so many cubic inches in the box. We put the bread in there, and then we filled that. We used flax, and that is scientifically figured out by the men that makes the machine.

Q. What machine?

A. The Koellner system. And you tell by that.

Mr. Butler: But the amount of flax that the box will hold, in addition to the bread?

A. Yes, and that gives me the volume in cubic inches.

# By Mr. Smith:

Q. Is that done at the mill? A. Yes,

665 Q. Did you ever have any of the bleached and unbleached, baked in your kitchen, by your wife, in the usual method in which women bake bread, and bake the other, too, to see the comparison between the flour?

A. Not that I remember.

Q. Now, these baking tests that were performed in the mill, you did that, personally? A. Yes.

Q. But you are not able to give us any of those figures at all now?

A. No, sir. I haven't any of those figures.

Q. How long ago was that done?

A. I should say a year and a half ago.

Q. You haven't any of these figures with you, here at Kansas City? A. No, I haven't.

Mr. Smith: That is all.

# Redirect Examination

# By Mr. Butler:

Q. These comparisons which you made, as to baking qualities of the bleached and unbleached flour, [we] made at various times, while you were bleaching at the mill?

A. Yes, sir.

Q. Now, I intended to ask, in substance, this question, in my direct examination. What would be the effect of bleaching a patent—good patent, reasonably short, mixed with a good first clear, as to whether or not it would make the two, taken together, resemble a patent?

A. They would.

Q. Have you tried that very thing? A. Yes, sir.

Q. And how about taking a straight patent, and a first and second clear, if they would be free from dirt and fibres, and put them together and bleach them all together?

A. I couldn't do that. Our second clear was too thin.

Q. Your second clear was too thin to be bleached, and worked off for a patent?

A. No. We wouldn't do that.

Q. Now, Mr. Smith asked you a number of times whether a person could tell the difference in color between a clear flour, bleached, and the clear flour, unbleached, and you answered affirmatively. Could that be told, otherwise than bringing them both together, in the customary

way, for comparison of flour color?

A. No. You would have to slick them up together.

Q. And you used some illustration, as in the case of a patent, unbleached, and a clear, bleached, and I understood you to say that the color could be told, but the clear would probably be lighter and the customer looking for white flour would probably take the bleached clear, as the better flour?

A. Yes, sir.

(Witness excused.)

Thereupon Court stood adjourned to meet again at 9 o'clock A. M. Thursday, June 9, 1910.

# Morning Session.

Kansas, City, Missouri, Thursday, June 9, 1910.

Court met pursuant to adjournment and the further hearing of this cause was resumed as follows:

Merton F. Dennison, called as a witness on the part of libelant, being duly sworn, testified as follows:

## Direct Examination

By Mr. Butler:

Q. Mr. Dennison, where do you reside?

A. Red Wing, Minnesota,

Q. What is your first name?

A. Merton F. Dennison.

Q. Merton F.? A. Yes, sir.

Q. What is your occupation?

A. Why, I am superintendent of the Lagrange Mill of Red Wing.

Q. The Lagrange Mill of Red Wing.

A. The Lagrange mill.

Q. You are a practical miller? A. Yes, sir,

667 Q. How long have you been following that occupation? A. Thirty years, a little over thirty years.

- Q. And how long at your present place? A. Nine years.
- Q. And in the capacity of superintendent all of the time?

A. Yes, sir.

Q. What is the capacity of your mill?

A. Twelve hundred barrel.

Q. Per day? A. Per day, yes, sir, twenty-four hours.

Q. Does your mill bleach its flour?

A. Well, we did, yes, sir.

Q. You did? A. For a year.

Q. At one time? A. Yes.

Q. When did you do that?

A. Why, we began bleaching a year ago the first of March and ceased last March.

Q. This March that has just passed, two or three months ago, you stopped two or three months ago?

A. No, that was two years ago—pardon me—we have not bleached for a year.

Q. You stopped about fifteen months ago?

A. Yes, sir, yes, sir, a year ago last March.

Q. Bleached for a year next preceding that?

A. Yes, sir.

Q. What kind of a bleacher did you have? A. Alsop.

Q. Did you become familiar with its eperation?

A. Yes, sir.

Q. And its effect upon the flour? A. Yes, sir.

Q. Did you bleach heavily or lightly?

A. Why, we thought we bleached lightly, that is, that was our intention, at least.

Q. And how could you control that on your machine?

A. Why, you control that with a rheostat, that is, you regulate the ampere that you are using, and also with the amount of air that goes through the work.

Q. So it can be controlled in two ways?

A. That is somewhat, yes, sir.

Q. The volume current of electricity and the volume current of air?

A. Yes, sir, you increase the volume of air and you decrease the bleaching, that is, it is not as strong, and of course if you decrease the amount of electricity used then you also decrease the strength of it.

Q. Now, as to the effect upon flour of increasing or decreasing the concentration of the gas with air?

A. Well, it would increase or heighten the color, that is whiten the color by increasing the gas, or that is, the strength of the gas by increasing the volume of air, why, it seemed to lessen the color, that is, it did not whiten it as much and that was the instructions given by the Alsop people.

Q. Did this process have an odor?

A. Yes, oh, yes, sir.

Q. And where could it be smelled?

A. Why, you could smell it in almost any part of the mill when we were bleaching.

Q. Any part of the mill? A. Almost, yes, sir. Q. In the flour after it came from the mill?

A. Yes, on the packing floor, yes, very readily.

Q. Did you have any opportunity to observe whether this gas attacks metal?

A. Why, yes, sir, it does; yes, it eats it, rusts it.

Q. And where did you observe that?

A. Why, I observed it—it was more prominent in the agitator.

Q. What kind of an agitator did vou have?

A. We have the Mitchell agitator and the construction of that is, there is wooden slides on the revolving beaters, or wooden slides and two of those slides are attached to iron flights, and those iron flights were very badly rusted, and we had the pipes filled up also, that is,

Q. The pipes, leaving the gas-

A. From the tank to the agitator, they filled up.

Q. You make patent flour? A. Yes, sir. Q. At that mill what is a patent flour?

A. Why, a patent flour is—well it should be properly speaking of middlings flour, of course, we gained a little on it, as we have learned how to handle our mill better and we are running in streams that don't come from the purifier, that is they are not purified middlings, it is pure flour; for instance, we use our second break flour in our patent, which is a very fine flour.

Q. You had something in your particular patent to 669 purify middlings?

A. Yes, as I say, this second break flour we added to our patent.

Q. Sent it out under a patent label? A. Yes, sir, yes, sir.

Q. And that other, do you call it a patent flour also?

A. Yes, sir, that is our first patent flour.

Q. What other flour do you make besides the patent?

A. Well, we make a straight, a first clear, and what we call a standard clear and a second clear, as well as a red dog; we are not making that, that is not a flour, that is not used for—

Q. Now, the kinds, the highest number of kinds of flour out of a kernel of wheat, we'll say, patent, first clear, second clear?

- A. Yes, a patent, a straight, a first clear a standard clear and second clear.
  - Q. When you make a straight you don't make a patent?
- A. No, sir—well, we make a patent, but our straight and patent and clear is run together.
  - Q. Now, what per cent patent do you make?
  - A. About eighty per cent.
  - Q. About eighty per cent? A. Yes, sir.
- Q. And when you run your clear and patent together you call it a straight? A. Yes, sir.
  - Q. What per cent is that?
  - A. That would be a 94 per cent. Q. And what would the rest be?
  - A. That is the per cent of the rest-
  - Q. The 6 per cent?
- A. That would be a second clear, and our red dog; we figure—our percentages are figured against everything, that is, red dog and all.
- Q. Now, when you were bleaching what kind of flour did you bleach? A. We bleached the patent.
  - Q. Did you bleach the clear?
- A. Why, I started out to bleach the clear, but it did not seem to warrant the bleaching; that is, it did not pay.
  - Q. Did you mix that together, bleaching the straights?
- A. No, well, we bleached the patent, and then ran the two straights together and that made our straight; we did not bleach the clear whether we were running straight or not.
- Q. Yes, sir. I see, you bleached your patent and ran it into the clear and called it a straight?
  - A. That was a straight, yes, sir.
- Q. Now, what effect upon the color mixture would that have? A. Well, it would whiten it.
  - Q. It would whiten it somewhat? A. Yes, sir.
- Q. Does wheat improve by aging and conditioning after it is milled? A. Yes, sir.
  - Q. And in what respect?
- A. Why, it gets whiter and works better that is, flour sometimes when it is milled is inclined to work a little sticky, that is when they make a dough of it it works sticky, and also is darker, of course, in the age alterations, of course, that stickiness is undoubtedly due to the gluten.
- Q. In case of bleaching flour by this Alsop process when it is fresh, what effect does that have as respects its appearance compared with what it will appear to be naturally a little later on after stored and conditioned?
- A. Well, it would be whiter, I don't think that aged flour would attain the whiteness that you could give to bleached flour.

Q. You think that bleaching makes it even whiter than nat-

ural aging does? A. Yes, yes.

Q. And the degree of bleaching that you did yourself would make it whiter than the same flour would become on natural aging?

A. Well, I don't know about that, no, I don't, I would not want to say that because we did not bleach very heavy; in fact we did not like it; we did it because we had to, that was all.

Q. Have you made any comparisons of the dough made from

flour bleached and the same kind of flour unbleached?

A. Why, that is, we always dough up our flour particularly—

Mr. Lyons: We can't hear you, Mr. Dennison; just speak a little louder, we don't hear you.

A. I say we dough up our flour particularly at the beginning of a crop: I do not make that a practice right straight through the year, because after we got ourselves located once on

a crop of wheat why we have our testing done in Minneapolis by the Howard people, but I dough up myself when we are starting in on a crop for a month or more.

Q. Now, what was your observation as to the quality of the

dough made from bleached flour and unbleached flour?

A. Why, of course, the bleached flour doughed up a great deal whiter than the unbleached flour; I sometimes thought that the bleached flour did not dough up quite as dry and work quite as strong as the unbleached, but of course that is pretty hard to tell, it was so close that I don't know that it's worth while to mention, anyway, but the color was marked.

O. Dough up very much whiter, you say?

A. Oh, yes, yes.

O. And you think there was some difference in the quality

of the dough?

A. Yes, oh, yes, sir, there was a decided difference, and in washing the doughs out after doughing up, why, of course the gluten would show very marked, that is, the gluten of the bleached flour was—well, it was whiter, more of a gray white; the gluten of the unbleached flour was creamy yellow.

Q. Yes. Now, as to the toughness or strength of the gluten

as evidenced by the elasticity of the dough?

A. That is where it would show, but otherwise it would be more in the gluten, you could detect it more readily in the gluten, than you could in the dough, that is the original dough after you wash the starch out, why, then of course, then in stretching that gluten you formed some idea that is, you think you did, anyway.

Q. Well, how was it?

A. Well, it was in favor of the unbleached flour; that is, I thought the gluten was a little stronger; it did stretch out further, make a thinner sheet, you know, you can take that gluten and stretch it out just as thin as tissue paper after you get it washed out, get the starch all out of it, and it would seem as though the unbleached would work a little better, stretch out a little thinner.

Q. That is in the degree of bleaching that you—

A. Yes, yes, sir.

672 Q. Now, is this Alsop process in your mill yet?

A. Yes, sir, yes, sir.

Q. Is it used for any purpose there now?

A. Why we are using it to sort of disinfect, that is, we are troubled with the Mediterranean moth, and we are driving them out with that, that is, it seems to be a great benefit in that respect.

Q. What is the Mediterranean moth?

A. Why, they are a pest that we have had—well, it has been about ten or twelve years now, I guess, they have got started up north. They work in the spouts and the like of that, fill them up with a web, and they're a great deal of a nuisance.

Q. How large are they?

A. Oh, they are about the size of an ordinary moth miller.

Q. Half to three-quarters of an inch long.

A. Yes, sir, probably not quite as long as the ordinary moth miller.

Q. Now, in what degree of strength do you use this modified air by the electric arc to kill the moth with?

A. Why, just the same.

Q. Just the same as you did upon the flour? A. Yes, sir.

Q. And does it kill them?

A. Why, you hold—we use a hose and carry that to different parts of the mill, and you get one on the floor and hold it right down on him, that is, pin him right there, blow it onto him and it will knock him, but they won't stay, of course, so that we drive them away, they leave us.

Q. That is by blowing this modified air? A. Yes, sir.

Q. In the spouts? A. Yes.

Q. And bins, the moth disappears?

A. Yes, sir, they do not like it, they won't stay there.

Q. And you can really assassinate one with it if you hold it on him? A. Yes, yes.

Q. Is it possible to make a 90 per cent flour—well, I withdraw that question. You heard the testimony of Mr. Tuucker here?

A. No, I did not-yes, sir, Mr. Tucker, yes, sir.

Q. He milled the flour that was seized? A. Yes, sir.

Q. You heard him describe his yield? A. Yes.

Q. Four bushels and a half of 59 pound wheat to the barrel of flour? A. Yes, sir.

673 Q. Are there any milling methods known that will take out 90 per cent of that kind of flour which may properly

be called purified middlings?

A. Why, not to me, no, sir. That is not a first-class patent flour, I should call his flour an ordinary straight, that is, from my point of view at least.

#### Cross-Examination.

By Mr. Smith:

- Q. What would these men that make the 50 per cent patent call theirs? A. I don't know, sir.
  - Q. But you do make an 80 per cent patent?

A. Yes, sir.

- Q. Other millers only make a 50 per cent patent, don't they?
  - A. I don't know of any that is making a 50 per cent.

Q. You heard some testify here, have you not?

A. I have heard them testify.

Q. You heard Mr. Ballard say that he only made a 50 or 55, didn't you?

A. Yes, that is winter wheat, soft winter wheat.

Q. So there is a greater difference between his patent and yours than there is between his and the flour in question?

A. It is an entirely different class of wheat.

Q. What kind of wheat do you use?
A. We use spring wheat, hard wheat.

Q. Raised where?

A. His is a soft wheat, winter wheat.

Q. That you mill?

A. North and South Dakota and Minnesota.

Q. This is spring wheat? A. Yes, sir.

Q. Hard or soft spring wheat? A. It is a hard wheat.

Q. Have you had any experience in milling the winter wheats that is raised in this latitude, section of the country?

A. Some, yes, sir, some.

Q. You grind some of it at your mill?

A. Not at the present mill I have ground it, though, ground 50 per cent of it, I have ground as high as 50 per cent of it.

Q. What do you mean-mix it? A. Yes, sir.

674 Q. With what?

. With spring wheat, with our spring wheat.

Q. At your mill up there?

A. Not at the mill I'm at now, no.

Q. What do you call it after you mix it?

1. Spring wheat flour, sold it for that.

Q. That is, you mix 50 per cent of Nebraska or Kansas or Missouri winter wheat?

A. 50 per cent of Kansas Turkey wheat.

Q. Kansas Turkey wheat with your spring wheat ground up into flour and sold it as spring wheat flour, have you?

A. Yes, sir.

Q. Branded it as such?

- A. Yes, sir; that is, it was not—we did not change our brand, that is.
  - Q. No, you put it in bags and sold it on the market?

A. Yes, sir.

Q. As spring wheat flour? A. Yes, sir.

Q. When as a matter of fact, half of it was made out of winter wheat? A. Yes, sir.

Q. Now, why do you mix it?

- A. Why, it was cheaper, Kansas was cheaper than spring, that was all.
- Q. It was cheaper to buy Kansas Spring wheat or Kansas winter wheat and mix it with your spring wheat, and then put it all out as being made out of spring wheat flour?

A. Yes, sir.

Q. As spring wheat? A. Yes, sir.

Q. Well, of course you tell your trade it was mixed?

A. I didn't have anything to do with the trade; I run the mill; that is out of my line.

Q. Of course your company told the trade that it was mixed, didn't it? A. I suppose they did, yes, sir.

Q. Now what do you know about it?

A. I don't know anything about it.

Q. But you know it was branded on the bags as being made out of spring wheat?

A. It was our regular brand, yes, sir; our spring wheat brand, yes, sir.

Q. Yes, are you doing that now? A. No, sir.

Q. When did you discontinue that?

A. This concern has never done that, the concern I am with at present has never done that.

675 Q. What concern was it that did that?

A. Why, I don't know that I have to answer that question: they are not interested.

Mr. Butler: That is more than nine years ago.

Q. When did you quit it?

A. Oh, it was twelve or fourteen years ago.
 Q. But you were the miller when it was done?

A. Yes, sir, I was the miller, yes, sir.

Q. Now, this spring wheat that you grind in your mill up there makes a much whiter flour than the flour that is grown from Kansas and Nebraska and Missouri, wheat flour, does it not?

A. Why, not whiter than some of it, no, sir; I think there is some Kansas mills that are making just a white flour as we

Q. Well, you know it is true, do you not, that your spring wheat makes a whiter flour than the winter wheat that is ground in Kansas and Nebraska and Iowa, that is raised here?

A. Why I know that when we grind our 50 per cent of Kansas we did not seem to have any trouble with their color

any more than we did without it.

Q. Have you ever seen any wheat that is ground here in the Kansas City mills that is made from wheat grown in Kansas and Nebraska or this vicinity?

A. No, I have not, no, sir, never have.

Q. You are not prepared to say, then, how they compare in color? A. No sir.

Q. Now, what is the capacity of the mill you are in now?

A. 1200 barrels.

### By the Court:

Q. Twenty-four hours, you said? A. Yes, sir, twenty-four hours.

By Mr. Smith:

Q. And how many sets of rolls? A. Thirty-seven stands.

Q. How many corrugated rolls?

A. We have twelve stands, that is double stands.

Q. And it has how many sets of smooth rolls?

A. The balance are smooth rolls.

Q. The balance of them? A. Yes, sir.

Q. Now, how soon after you commence your grinding, do you draw off patent flour?

A. From the second break.

Q. The first break you do not draw off any patent flour from that, but from the second break you begin to draw off patent flour? A. Yes, sir.

Q. And how long do you continue it?

A. That is the end of that, of the patent flour, that is, you mean of the break-

Q. No, after it begins to go through the smooth rolls it would all be patent flour all the time?

A. Why, no, not all the smooth rolls no, sir.

Q. Up until how many?

A. Why, until our sixth reduction is patent, that is the smooth rolls alone, you say?

Q. Yes, do you make any of what is called the red dog?

A. Yes, sir.

Q. Well, do you regard that as a flour? A. No, sir.

- Q. You don't sell that on the market as flour; it goes out as feed?
  - A. That is a good deal for foundry flour and for feed.

Q. What is the name of the mill?

A. Lagrange, the Lagrange Milling Company.

Q. Red Wing? A. Yes, sir.

Q. What part of Minnesota is that in?

A. Well, Goodhue County, that is the eastern part; we are right on the Mississippi river, about forty miles from Minneapolis or fifty mile.

Q. Now, when you were buying this Kansas winter wheat and grinding it and selling it as Minnesota spring wheat, why

do you mix it; why didn't you use all Kansas wheat?

Mr. Butler: I believe I will note an objection. It was about fourteen years ago when he had that experience; it is not called out by anything referred to on direct examination.

The Court: Let him answer. Proceed, you may answer.

A. I don't understand the question.

(Question read by the reporter)

- A. Why, no, I was milling generally our local receipts furnished us with about half of what we ground.
  - Q. Is that the reason you did not use all Kansas?

A. Why, possibly—

- 677 Q. Well, I am not after a possible reason; I am after the actual reason.
- A. I don't know that; I didn't have anything to do with the buying, the financial part of the mill.

Q. All you did is the grinding? A. Yes.

Q. Now, when you bleached the wheat there in Minnesota was there a noticeable difference in the color before and after bleaching? A. Oh, yes, sir, a marked difference.

Q. When you bleached the clear flour, or did you ever bleach

the clear?

A. Yes, sir, I started out to bleach the clear but I discontinued.

Q. But you found out that was not a success?

A. Why, it was all right, but the trade did not seem to care, that is, I don't think the trade cares much in the clear trade.

Q. As a matter of fact, from the commercial standpoint, the practical standpoint there was no benefit or advantage in bleaching the low grade flour, is there?

A. I didn't find it so, no sir.

Q. You never heard of a miller that did find it advantageous to bleach the low grade flour, did you?

A. Why, not the low grade, most of the millers up in that

country bleach the clear, the first clear.

Q. The first clear?

A. Yes, the great majority of them do.

Q. In the mill what you regard as low grade flour you never found it advantageous to bleach that?

A. No, no, I did not.

- Q. Now, when you would bleach a straight clear and compare that with samples of your patent flour which was unbleached? A. Yes.
  - Q. Now, was the color there noticeable? A. Yes.

Q. A distinction? A. Yes.

Q. The unbleached had the cream color?

A. Yes, sir, it was marked.

Q. And the bleached had a whiter color? A. Yes, sir.

Q. Readily noticeable? A. Yes, sir.

Q. So the distinction between a bleached flour, I don't care what grade it is, and high grade unbleached flour is readily distinguishable, isn't it? A. Yes, sir.

678 Q. One presents a sort of yellowish or creamy appearance, and the other one is a whiter? A. Yes, sir.

Q. Anybody can distinguish that color?

A. Anyone, yes, notice it.

Q. They did not look so much alike but what anybody who would make a comparison could see the difference?

A. Oh, yes.

Q. Now, in making your dough tests did you have apparatus there by which you could scientifically measure the strength of the gluten? A. No, sir.

Q. Or measure its weight? A. No, sir.

Q. Or its volume? A. No, sir.

Q. All you did was simply to take it in your hands and such tests as you could make or take of it? A. Yes, sir.

Q. Of course you don't pretend to say that that would be

an accurate determination?

A. No, sir, would not, any more than as far as the color is concerned, and I would form my own notion in regard to it.

Q. The color, of course, was noticeable to the eye?

A. Yes.

Q. About the only way you could determine the color is by

the eye? A. Yes.

Q. But as to the question of the volume of it or its strength or its elasticity you had no apparatus for making any accurate determinations?

A. Nothing any more than to satisfy myself, that was all.

Q. You said you tested this up with each year's crop?

A. Yes, sir, yes, sir.

Q. Now, is it true that each year's crop will vary from the other in that respect?

A. Yes, sir, yes, sir.

Q. Now, is it true that each year's crop will vary from the other in that respect?

A. Oh, yes, sir, yes, sir.

Q. Different wheats vary, do they? A. Yes, sir.

- Q. Wheat that is brought in by one farmer will differ from the wheat brought in by another one? A. Yes, sir.
  - Q. Depending somewhat on the soil on which it is raised.
    A. Yes, sir.
- 679 Q. And the particular time when it is harvested, does it? A. Yes, the class of wheat, the kind.

Q. The time it has lain outdoors in the shock or in the stack? A. Yes.

Q. All those things will tend to make different kinds of wheat, or different farmers' wheat differ from each other?

A. Yes, sir, to a certain extent.

Q. To a certain extent, so that the peculiar doughing qualities of one farmer's wheat would not be exactly the same as the doughing quality of another farmer's wheat?

A. No. no.

Q. Why that is true, isn't it; and it is true, isn't it that in those tests that you made there the color was the only difference that was really noticeable and plainly distinguishable?

A. Yes, sir.

Q. That you could always see? A. Yes.

- Q. The other qualities was not such a difference that you would be prepared to say that there always was a difference between.
- A. Why, yes, I said so, that is in my own mind I thought there was.

Q. You thought there was? A. Yes.

Q. But it was simply made by testing there in the mill?

A. Yes.

Q. Incidentally as you went on with your work?

A. Yes.

Q. But the color between any kind of flour that was bleached and your best patents that was unbleached, or your straights that were unbleached, was always clearly apparent?

A. Yes, sir.

Q. Anybody could see? A. Yes, sir.

Q. All you had to do was to look at it? A. Yes, sir.

### Redirect Examination

By Mr. Butler:

Q. You would have to look at it in comparison with the other right beside it, however, in order to see any difference, would you not?

A. Why, yes, sir, yes.

Q. And when you say you recognized the difference in color, you mean in bringing the two flours slicked up together?

A. Yes.

Q. And dipped in water to bring out the color?

A. Yes.

680 Q. That is always understood, isn't it, among millers?
A. Oh, yes, that is it was as far as I am concerned.

Q. Do you know whether it is the habit of housewives in purchasing flour from their grocers to dip it and slick it down to compare colors?

A. I don't think they do; I never heard of anything of the

kind.

Q. Now, in the comparisons which you made in washing out the gluten and testing the dough or working the dough, Mr. Smith called, in that connection, called your attention to the difference, that is, of wheat? A. Yes, sir.

Q. Which sometimes came from farms near together?

A. Yes.

Q. Now, in the comparisons did you use the flour from the same kind of wheat that came to the mill about the same time,

so as to get a line on it?

A. Why, our flour does not vary, that is, according to the classes of wheat, we mix, we have 50 thousand bushels of wheat mixed up all of the time, well, not fifty, but thirty-five, twenty-five to thirty-five thousand bushels of wheat mixed up all the time, that is going into the mill, and of course the mill cannot run any other way.

Q. So the difference that you mention as having observed in the gluten was not dependent upon difference in the wheat?

A. No, sir, no, sir.

Q. The only difference there was one was bleached and the other was not? A. Yes, sir.

Q. Now, you said that most millers in that country bleach-

ed their flour, but that you do not?

A. Why, I think most of them bleach it, I talked with a great many and—

Q. Now, that there may be an understanding, if possible, as to that, the first is the patent? A. Yes, sir.

Q. The next is the clear?

A. The next is the straight.

Q. The next is the straight, that is the patent and clear mixed together?

A. That is you mean in grade, in quality?

Q. Yes. A. The patent, straight, clear.

681 Q. Yes, sir.

A. What we call our standard clear and our second clear.

Q. Now, the low grades.

Judge Scarritt: That is a division in his own practice, as I understand it; is that right?

Mr. Butler: It was not exactly the question I had in my mind either, Judge.

Q. Now, leaving out the straight, which we understand to mean the whole flour, when we come now to divide up the flour from any given wheat, it is patent, clear, which may be divided into first or second, and some call the next low grades, and some call the next red dog? A. Yes.

That is, low grades and red dog are interchangeable?

- Yes. A.
- Q. Some millers call low grades red dog, and other millers call the same thing low grade?

A. Well, some, say that, that is all.

That is what I mean. A. Nothing definite about that. O.

Q. So that when the patent and clear are both bleached, that amounts to the bleaching of practically all of the flour content of the wheat, does it not? A. Yes, sir.

For convenience in opening the case to the jury I brought in something that I understand to be red dog, and I call to your attention, it is in a bottle marked "red dog", and ask you if that is the substance that is usually understood by mil'ers to be red dog and called by some low grades?

A. Yes, sir, that resembles ours a great deal; a little redder,

more dog about it, I guess.

Now, when the patents and clears are bleached, does that mean that all of the flour that is made from the wheat is bleached except such as that stuff in that bottle called red dog. which may vary, of course?

That is, you mean the first and second clear? A.

Yes. A. No, we would have a second clear also. Q.

Q. But I said the patent and the clear?

The patents are first-class, yes, sir, certainly. A.

Now, some mills do not divide the clear into first and second, but put all the clear together? 682

A. Yes, sir.

You divide it into first and second? A. Yes, sir.

Now, what I am getting at is this, you said up in that country most all of the millers bleached the clear as well as the patent? A. Yes.

What I am getting at is that you bleach all of the flour

except such stuff as is in that bottle called red dog?

- Most of the mills up my way make a second clear, that is the most larger sized plants, and they do not bleach the second clear: I never knew them to anyhow.
- So that would leave the red dog such as in that bottle and the clear somewhat above that?

A. Yes, sir, yes sir; the second clear is a pretty fair flour.

Q. That contains the germ?

A. Well, we do not aim to have any germ in it; we aim to make it as clean as possible, of course, there is very little germ in the second flour.

By the Court:

Q. You mean the germ of the wheat? A. Yes, sir.

By Mr. Butler:

Q. That is what I meant in my question.

The Court: You don't mean some objectionable bug or anything of that kind?

Judge Scarritt: Microbe.

Mr. Butler: No, I mean the seed germ.

By the Court:

Q. What do you mean, Mr. Witness?

A. The germ of the wheat, it pulverizes, more or less in grinding, you see.

By Mr. Butler:

Q. The millers aim to eliminate that nearly, do they not?

A. Yes, sir.

Q. When they are making flours they aim to get that out into the feed.

(No answer.)

William Graham, called as a witness on the part of the libelant, being duly sworn, testified as follows:

# 683 Direct Examination

By Mr. Butler:

Q. You live at Groton, in South Dakota? A. Yes, sir.

Q. And your occupation? A. Miller. Q. How long have you been a miller?

A. About thirty years.

Q. How long at Groton, South Dakota.

A. Twenty-three years, I think.

Q. Are you the man in charge of the operation of that mill? A. I am.

Q. One of its proprietors? A. Yes, sir. Q. And what is the name of the mill?

Q. And what is the name of A. Groton Milling Company.

Q. Groton Milling Company. Is it a corporation or a partnership? A. It is.

Q. It is a corporation, and you are one of the officers of the corporation? A. Yes, sir.

Q. Does your mill bleach its flour?

A. It used to; it does not now.

Q. When did it begin and when did it stop bleaching?

A. Well, I couldn't tell you when I began. I didn't think to look it up and I don't remember; I think that we blenched about two years.

Q. When did you stop?

A. Well, we stopped when we were notified to stop.

The Court: The question is when you stopped.

## By Mr. Butler:

Q. About the date; I just intended to call for the time?

A. I think it was along in January some time.

### By the Court:

Q. What year? A. Of 1908, I think.

### By the Court:

Q. Two years ago last winter or one year, or what date?

A. Well, I don't just remember when they stopped bleaching.

#### By the Court:

Q. That ain't the question; fix the date as near as you can —well, go ahead.

### By Mr. Butler:

Q. At any rate, you bleached a couple of years and stopped recently? A. Yes, sir.

O. Either a year or two years and a half ago, something of

that kind? A. Yes, sir.

- Q. But whether it is one year and a half or two, you do not at this moment recall? A. I don't know.
  - Q. What kind of a bleaching apparatus did you have? Navlor and Girard.

A. Naylor and Girard.
Q. How is that made?

Judge Scarritt: We object to that as immaterial.

Mr. Butler: I want to show-

Witness: Well, we have an agitator.

Mr. Butler: That is admitted by Mr. Elliott here.

The Court: Yes, go ahead.

A. We have an agitator which is about twenty-four inches, I think, in diameter, about five feet long, one end of the agitator has a little fan; on top of the agitator sets a jug that we put the acid in.

Q. What kind of acid?

A. I don't know, I don't know the formula of it.

Judge Scarritt: We object to proceeding further, if the court please, that is enough to show that it is not the same process.

Mr. Butler: Mr. Elfiott yesterday admitted that the Naylor and Girard employed the same bleaching medium as the Alsop process. He said he employed NO2.

Mr. Elliott: I said it employed peroxide of nitrogen.

Mr. Butler: Do you deny that the Alsop process-

Mr. Smith: Go on with the witness, not examine each other.

Judge Scarritt: I make the objection.

The Court: I will allow this witness to go on the statement just made by Mr. Elliott that the result is nitrogen peroxide.

Judge Scarritt: We renew the objection to the question and to the suggestion of the court, which says that one is made from acid and the other from acid.

The Court: Mr. Elliott in open court has admitted that the resultant gas is the nitrogen peroxide. On that 685 statement he may answer.

To which ruling of the court claimant then and there duly excepted.

Witness: On top of this agitator sets a jug that we place this acid in. Upon the pipe that the fumes pass through the flour there is a little feed that we feed a wire down through this feeder into this acid. This wire striking the acid forms a fume, passes up out of the top of the jug and is blown through this pipe into the flour. We use a soft iron galvanized wire that we feed in the acid.

By the Court:

Q. What is called sulphate of iron; do you know what it is called?

A. No, it is galvanized wire; we buy it as galvanized wire.

By Mr. Butler:

Q. You put that into the acid and fumes arise?

A. Yes, sir.

Q. Then what do you do with the fumes?

A. Blow it into the flour. Q. And into the acid?

A. Why, head the agitator into the flour and the flour strikes, of course the flour goes through the agitator and the

flour strikes or the fumes strike the flour at the head of the agitator.

Q. And what kind of an agitator do you have there?

- A. Horizontal round beaters inside, or not beaters, but a kind of a conveyor.
  - Q. How long would the flour remain in the agitator?

A. Oh, I don't know.

Q. Keep right on going through? A. Yes, sir.

Q. So the flour comes in at the top of it?

A. And passes out the bottom.

Q. And goes over some fan and goes out and keeps right on going, is that it?

A. Yes, well, there is no fans, it is a kind of a reel, some-

thing similar to a differential reel.

Q. How far does it have to go from the time it gets into the agitator until it gets out?

A. Oh, I think about four feet.

- Q. Then keeps right on going all the time?
  A. It goes into the bend from the agitator.
- 686 Yes, but I mean when it goes into the agitator at one end it goes through it and goes out at the other?

A. Yes, sir.

Q. And does it keep on going all the time it is in the agitator? A. Yes.

Q. About as fast as it would fall or nearly so?

- A. Yes, yes, the stream, it takes the stream that falls.
- Q. So that the flour is in the agitator about as long or a little longer than it would take to fall four feet?

A. Oh, yes, yes.

Q. I am trying to get the duration of time when a given quantity of flour would be in the agitator.

A. Well, I couldn't tell.

- Q. Yes. Well, it is a very short time, is it, or not?
- A. Well, it is a short time; doesn't remain there long.

By the Court:

Q. What process is this called? A. Naylor & Girard.

By Mr. Butler:

Q. Have you had opportunity to observe the effect of this bleaching medium, the fumes, mixed with air, on metals?

A. Some.

Q. What effect does it have?

A. Why, in the pipe that passes the fume from the jug through to the flour, there is a yellow substance gathers in there, and you notice little chips, little scales of iron. 482

Q. Have you had opportunity to observe the effect upon flour that remains exposed to this medium for a considerable length of time? A. Nothing only to look at it.

Q. What was it, how did it appear to be?

A. Well, it is not as dark as the rust, or whatever you call it, you get out of the pipe, it is lighter than that, but it is a very dark yellow.

Q. As dark as an orange or lemon or sulphur?

A. Oh, something perhaps.

Q. Did you examine any such flour?

A. No, sir, not to bake or dough up, or anything.

Q. Now, what effect does this gas, mixed with atmospheric air have upon flour in the ordinary use of the process?

A. Bleaches it.

687 Q. And as to the degree of bleach, can that be controlled? A. It can.

Q. How?

A. The more wire you feed into your acid the higher your bleach is.

Q. That is, the more the bleaching will be?

A. The faster you feed your wire into the acid the more flour is—or you use more acid, of course the more wire you feed the more acid you are using.

2. And how about the fumes?

A. Well, the fumes, you get more fumes, I suppose, if you get more acid.

Q. That is the degree of bleaching depended upon the

quantity of fumes mixed with the air?

A. It does, you understand me, this is not mixed with air.

Q. It is not mixed with air before it goes in; how does it

get in?

A. It is blown in; these fumes rise up at the top of this pipe and the air blows the fumes to the flour.

By Judge Scarritt:

Q. Not mixed with air, you say?

A. Only in the air blowing through the fumes after it reaches the jug.

By Mr. Butler:

Q. Well, not, let us get that. You have a jug.

A. Yes.

Q. Something that the acid won't eat up? A. Yes, sir.

Q. Then you put wire into your jug? A. Yes, sir.

Q. And then fumes come up? A. Yes, sir.

Q. What color? A. Yellow.

Q. And then the next thing that happens is a blast of air blown across the fumes? A. Yes, sir.

Q. And that is by means of the pipe conducted into the place where the flour comes, called the agitator?

A. Yes, sir.

- Q. And there is no mixture of the fumes with the air except such mixture as is effected by this blast of air right through the fumes? A. No, sir.
  - Q. That is all, and you can control the volume of air, can you? A. No, no.
- 688 Q. There is no arrangement to control the volume of air? A. No, sir.
- Q. Did you compare flour that was bleached by this bleaching process with flour that had not been of identically the same kind? A. Yes, sir.

Q. What change is effected by the bleaching as to the ap-

pearance of the flour and its quality?

- A. The flour after bleaching has a whiter color, I won't call it a white color, it is a dead color, it is a dull white or an ash white, where the unbleached has the yellow tint.
- Q. Now, as to the quality of the flour, have you made bread with it? A. I have.
  - Q. Under like conditions? A. Yes, sir.
    - 2. By this chemical process? A. Yes, sir.
- Q. Now, tell us what effect this product, nitrogen peroxide gas, blown into the flour has upon the flour?
- A. Well, I find that I get a little better volume from the unbleached flour.

Q. Volume of what?

- A. Volume of loaf, I get a little higher loaf with the unbleached flour, it seems to have a little more water and makes a little more bread to a given amount of flour.
  - Q. Color, odor, taste, if any change?
  - A. The color is whiter or a dull white.

Q. Of which?

- A. Of the bleached, or a creamy white of the unbleached. The odor, I cannot distinguish any odor between the two breads.
  - Q. The bread seems to be the same?

A. Seems to be the same.

Q. The taste the same or different?

A. No, they are different, the taste of the unbleached flour tastes of the natural wheat, you take and chew up your wheat and you get the same flavor of your unbleached flour as you do of nice, clean sound wheat. The flavor of the unbleached is not so palatable.

- Q. I think you have said "unbleached" in both instances?
  - A. The unbleached has the flavor of the pure wheat.

Q. Yes, and the bleached now?

A. It is not so palatable, not so good to the taste.

Q. As to the elasticity of the dough between the bleached and unbleached, treated exactly alike, except 689 one is bleached and the other is not?

In the whole loaf?

Yes. Q.

Well, I can't see any difference. A.

In the working of the dough? In the working of the dough. A.

Now, in the gluten washed out of the whole dough? Q.

Well, the gluten after it is washed out is considerable A. whiter or this dull, this ashy white.

Now, did you observe any difference in the elasticity of

the gluten? A. Yes, sir,

Which was the stronger? A. The unbleached.

Now, as to the degree of difference, was it slight or con-

siderable?

- No, it was not so awful much in stretching it out and working it out into a thin sheet like tissue paper, in working it out your finger would pass up through your bleached gluten, it would not stretch up over the end of your finger as well as the unbleached.
  - Now, did you bake regularly from time to time?

A. Yes, sir.

A part of your milling operations?

Yes, sir; I never have made very many different tests

between the bleached and the unbleached.

Were your tests or observations extensive enough to determine whether or not the difference between the bread made from the bleached flour and the bread made from the unbleached flour depended upon the amount of bleaching, that is take a case of heavy bleaching, the use of a lot of this gas as compared with one where considerably less was used?

A. Well, the highest I ever bleached was one notch of wire

feeding to my jug, where I could use four.

Q. Yes.

I would use about six feet of No. 4 galvanized wire in twelve hours to a good pint of gas.

Now, did you ever have any opportunity to observe or test the relative keeping quality of the flour? A. Yes.

What was that?

Well. I have taken the bleached and the unbleached and placed it in a box which I consider was tight, placing the flour in a sack, wrapping the sack with paper and putting it in a dark place, taking two samples of the same flour, putting them in a sack and placing them in the light and air.

five months and eighteen days I think I baked them and I found that the flour that had laid to the light and air. 690 the unbleached, was far superior to anything that I

baked.

Mr. Smith: Your Honor, I move to strike that out as a conclusion of the witness.

Mr. Butler: I am not at all certain that the miller may not say one flour is better than another.

The Court: Well, of course, I know there things are very close along the border line, what is a subject of opinion and what is not, and I will strike that out.

Mr. Butler: Very well, strike it out.

By Mr. Butler:

Q. Well, I would like to have you compare the elements then of the flour and of the bread made from the flour in each pair, the pair kept in the dark and the pair kept in the light.

A. I have them in my pocket.

Q. You have preserved the data? A. Sir?

Q. You have preserved the results? A. Yes, sir.

Q. You may refer to them.

Judge Scarritt: Did he make them at that time—you made them yourself?

A. I did.

By Mr. Butler:

Q. At the time of your observation?

A. Baked them all in one day and took the flour out the same day.

Q. They were truthfully made? A. Yes, sir.

Judge Scarritt: Did you make your memorandum the same day, the same time?

By Mr. Butler:

Q. You made your memorandum the same time you did the baking? A. Yes, sir, yes, sir.

Q. Now, you may give us the comparison; give us the two pair first.

Judge Helm: Is this on the bleached flour?

Q. There is one sack of bleached and one of unbleached; they were wrapped up and put in a box and kept in the dark for five months and 18 days.

A. You want the unbleached first?

691 Q. I want the pair—I don't care which you give me first; give us the unbleached first, the dark.

A. Here is the patent flour.

Q. This is the unbleached now, is it?

A. This is bleached and placed in the light.

Q. All right. Then we will start with the other part and take the bleached. This is from the pair that was kept in the

light for five months, and he will speak first of the bread made from it.

A. The pair that was placed in the light.

Mr. Smith: Let him speak, then we'll see.

Q. Now, which one are you telling us first, the bleached?

A. The bleached.

Q. Go on.

A. The bleached patent, using the same amount of flour and ingredients, the same amount of water, I got 515 grams of bread, grams baked out 34; time to raise 55 minutes, this is a straight dough made according to the Koelner system; temperature of oven 360; cubic inches of bread 88, using 95% inches of seed.

Q. That is the flax seed that you put in the box around the

bread to find out its volume? A. Yes,

Q. Its volume? A. Its volume is 88; color a dull white.

By Judge Helm:

Q. What is that?

A. Color a dull white, flavor not so palatable.

Mr. Smith: I am not going to object; I can see we are getting to the line and I am simply claiming the same privilege later on myself.

The Court: All right.

A. Texture of bread, good. Now, that is the bleached. Now, this is the unbleached, the same amount of flour, the same amount of water, gave me 522 grams of bread; time to raise 55 minutes; temperature of oven 360; cubic inches of bread 93; number of inches of seed used 9; color creamy white; flavor good; texture good.

Q. Now, as to the bread made from the flour which was

wrapped up and kept in the dark as you describe.

A. Patent flour bleached and placed in the dark.

Q. By the way, were those four bags all the same kind of flour.

692 A. Yes, sir, yes, sir.

Q. This is the bleached?

A. This is bleached. Total grams of bread, 519; time to raise 50 minutes; temperature of oven 360; cubic inches of bread, 88; number of inches of seed used 9 5/8ths; color of bread dull white; flavor not so palatable. Unbleached, 522 grams of bread; time to raise 50 minutes; temperature of oven 360; cubic inches of bread 88; number of inches of seed used 95%; creamy white color; flavor good; texture of bread good.

By Mr. Smith:

Q. How is that? A. Texture of bread good.

Q. Was this bread made from wheat that had been through the sweat or that had not, I mean whether it was made from new wheat or old wheat?

A. Made from old wheat; it was made in January and our

new wheat comes in about September.

Q. Now, as respects the quality of flour, color, quality and color of flour made from new wheat as compared with the flour made from the same wheat if it has been aged and conditioned, and gone through the sweat, is there any difference? A. Yes.

Q. What is the difference?

A. The flour from the new wheat will be more yellow, and I don't think that—it won't take quite so much water in baking it up.

Q. Is it well adapted for bread making as if the wheat

had been old and in condition?

A. No, the new wheat, you mean?

Q. I mean the new wheat flour? A. No.

Q. Now, what is the effect of bleaching upon that kind of

flour as to its appearance? A. Well, it is white.

Q. And whether or not it makes the flour appear generally like flour made from the same wheat after it had been through the sweat and aged and conditioned? A. Without bleaching?

Q. Yes. A. No, they did not compare. Q. They would not compare? A. No.

Q. Well, would the difference be greater, made greater by the bleaching or less?

A. It would be made greater by bleaching.

Q. That is, my question is this, you take new wheat that has been through the sweat?

A. Right from the threshing machine, you mean?

693 Q. Yes, and mill it? A. Yes, sir. Q. Make flour of it? A. Yes, sir.

Q. That flour is yellowish? A. Yes, sir.

Q. And not quite so good for bread making, you say, as flour would be from the same wheat if it has been through the sweat? A. No, it is not so good.

Q. Now, suppose you bleach that new wheat flour, does it make it look like the flour made from old wheat that has been through the sweat, or does it make it look still different?

A. It makes it look whiter.

Q. It makes it look whiter? A. Yes, sir.

Q. It makes it whiter than the flour which would be made from the wheat if it had been aged and conditioned?

A. Yes, sir.

Q. Now, as respects the color and quality of fresh flour made, we'll say from good wheat that has been aged and conditioned, how does the color and quality of the flour while 694

fresh, not having been bleached, compare with the quality and color of the same flour after it has been aged and conditioned?

A. Well, after it is bleached, why, it would be-

I am not speaking of bleaching now leave out bleaching altogether. A. What is the question?

I want the color of fresh flour? A. Yes, sir.

Made from good, sound wheat that has been aged and conditioned, the color and quality as compared with that same flour after it has been aged and conditioned?

Well, you mean to find out whether-

What is the effect of aging and conditioning a good flour made from good wheat without any bleaching at all; that is what I am trying to get at? A. That is whiter.

Q. Now, as to quality? A. It gets better.

In what respect?

The dough is tougher, the gluten is a little tougher, and it requires a little more water.

Q. Now, the effect upon the appearance of fresh flour of that kind of bleaching, does it make it whiter?

To bleach that flour?

Yes, sir. A. Yes, it will make it whiter.

And does the degree of whitening depend upon the amount of bleaching that it is subjected to? A. Yes, sir.

What is a patent flour, Mr. Graham?

We consider a first patent flour as long as we can make good, clean, sharp, purified middlings.

You heard the testimony of Mr. Tucker? A. No.

Mr. Tucker on the stand-Q.

By the Court:

You say no?

No, not all of it; I heard just a little of it.

By Mr. Butler:

Q. In your opinion, can 90 per cent, in their 90 per cent patent, be made of that kind of a patent, high or first quality patent, containing only the purified middlings such as you describe here? A. Not with our spring wheat?

Q. You are not familiar with the Nebraska? A. No. sir.

I think that is all.

# Cross-Examination

By Mr. Smith:

You don't know anything about Nebraska wheat?

No. sir. A.

Never grown any? A. Never grown a bushel.

Did you ever have any experience in milling Nebraska or Kansas or Missouri wheat? A. No, sir.

Ever use any flour made from that?

A. Yes, I used flour made from that, but I never tested it,

or anything like that, just looked at it.

Q. So you would not be able to express any opinion of the comparative color or strength or feeling or anything else?

A. No, sir.

Q. The process you used there was what you term the Navlor & Girard process? A. Yes, sir.

Q. You had a jug, you say, sitting on top of the agitator or sitting some place?

A. It sits right up on top of the agitator.

Q. It contains a liquid, a fluid? A. The jug, yes, sir.

Q. What is its color?

A. It is a blue when it is put into the jug.

695 Q. Pronounced blue?

- A. Oh, no, no, it is not a pronounced blue, it looks blue in color.
  - Q. Blue as indigo? A. Oh, no, I don't think so.

Q. That is a distinctive color of this blue, is it?

A. It is blue.

Q. Now, in order to generate with that apparatus then you put in this jug some wire? A. Yes, sir.

Q. What kind of wire is it? A. Galvanized wire.

Q. Now, does the action of this fluid that you have in there eat up the wire? A. Yes, sir.

Q. So that as you continue your process you put more and more wire in it?.

A. It feeds-the wire feeds itself.

Q. That is, it sinks down in there that way, does it?

A. Yes, sir.

Q. In running your mill say a period of twenty-four hours you would mill how many barrels of flour?

A. Oh, 200, 250.

Q. That is the capacity of your mill?

A. 250 barrels.

Q. 250 barrels a day in milling, that is, 24 hours, how much of this galvanized wire would you consume?

A. I would use the way we are bleaching, twelve feet in

24 hours.

Q. 12 feet of wire? A. Yes, sir.

Q. That would be entirely eaten up or disintegrated by this fluid? A. Of No. 4 wire.

Q. By that you mean size No. 4 galvanized wire?

A. Gauge No. 4 wire.

Q. How would it be in size compared with that cord say, that attaches the electric light?

A. A little larger, I think.

Q. You think, and you consume about 12 feet you say?

A. 12 feet.

Q. 12 feet in 24 hours. Now, in this pipe you say you found scales of iron, you mean scales that were parts of this wire that had been disintegrated by the action of the acid in the jug?

696 A. No, sir.

Q. Where did the scales of iron come from?

A. From the pipe.

Q. How long did you use that pipe with your method?

A. All the time I have used the bleacher.

Q. And how long was that?

A. Oh, perhaps a couple of years, something like that.

Q: How often did you have to replace that iron pipe during that two years? A. Never had to replace it.

Q. One iron pipe lasted two years? A. Yes, sir.

Q. All right. Now, how did you bleach all your flour, or a part of it?

A. All of it with the exception of the low grade.

Q. Before you bleached it the color of your different grades of flour was readily discernible, was it?

A. Yes, sir.

Q. And after you bleached the different grades were they

all the same color, or was there a difference then?

A. Well, I think that the clear flour takes a little more bleaching than the other, that is, it would show a little whiter.

Q. Than the patent? A. Yes, sir. Q. After you bleach a clear flour?

A. No, understand me that I think it bleaches more in

comparison.

Q. I see, but after you have bleached your patent flour and your clear flour there is a noticeable difference between those two, is there not? A. Yes, sir.

Q. Just as noticeable as there was before you bleached

them. A. Well, no.

Q. Not quite so much? A. Not quite so much.

Q. Before you bleached, though, there was such a difference between your patent and straight, your patent and clear, that you could readily tell which is which by looking at it, could you not?

A. Why, yes, sir, comparing the samples with the standard;

we have a standard to work by.

Q. A standard of comparison? A. Yes.

Q. That would be true if you were determining the color on anything, wouldn't it? A. Yes, sir.

Q. To see whether one thing is more so than the other you have got to have some standard to go by, haven't you? A. Yes, sir.

Q. And that applies to everything in which you use colors, whether it is bleached flour or anything else, doesn't it?

A. Yes, sir.

Q. Now, after you have bleached them there is a difference between the color of the patent and the straight or the patent

and the clear, is there not? A. There is a little.

Q. Now, after you had bleached the straight or after you bleached the clear is there any difference between the color of those two and the color of the patent unbleached? A. Yes.

Q. How much? A. Well, quite a little.

Q. Readily observable?

A. Yes, now, understand me, this is a different white than the unbleached.

Q. How different?

A. Well, the unbleached will always show a creamy tint.

Q. Yes, and the bleached, what does it show?

A. And the bleached will not.

Q. Now don't you get them, they look just alike?

A. No. sir.

Q. Did you ever try to make them look alike?

A. Never did, I never thought I could.

Q. Did you ever get them so they look alike?

A. No, not exactly.

Q. Didn't you get them so you could tell one from the other? A. In color?

Q. Yes, sir. A. No, I don't think I ever did.

Q. Never did. You never got it then so but what between the patent unbleached and either the straight or the clear bleached, there was a noticeable difference in color, is that right?

A. No, of course there is a difference in color all right, but

it is a dead color.

Q. All right. It is a different color then, was it?

A. The clear flour will show a more ashy gray than the patent will.

O. All right. Then you never got it so but what the unbleached patent had a different color from the bleached straight or the bleached clear?

A. Never compared them to find out.

698 Q. Oh, did you never look at the unbleached patent and the bleached to see whether or not they had different colors? A. I have, but I never put them together.

Q. Well, you could tell by looking at them whether or not

they are the same color, can't you? A. No, no.

Q. Well, do you know whether or not they are the same color? A. I do not.

Q. Sir?

A. I do not just exactly, there is a difference in the color there.

Q. Well, all right, that is what I am getting at, there is a difference in the color, is there? A. Why, sure.

Q. Always? A. Yes, sir.

Q. Now, you know that of your own personal knowledge?

A. Yes.

Q. All right. Now, when you have bleached the patent and then put it along by the side of the unbleached patent, now, do they look alike?

A. The bleached patent and the unbleached patent?

Q. Yes, sir. A. No, sir.

Q. Well, then, the fact is, as I understand it, as you have noticed it, that the unbleached flour, whether patent, clear or straight, always has a different color from the bleached patent or from the bleached flour, patent, clear or straight?

A. The unbleached?

Q. Yes.

A. Has a different color from the bleached, yes, sir.

Q. Always? A. Always.

Q. Noticeable? A. Yes, sir. Q. Can see it? A. Yes, sir.

Q. Plainly? A. Yes.

Q. Anybody can, that is, anybody that has got good eyesight and reasonable sense of sight and can distinguish colors? A. They ought to.

A. They ought to.
 Q. And that was your experience there in your mill.

A. Yes, sir.

Q. Now, I want to find out a little about this taking tests that you made. You speak of 500 and some odd grams, how many loaves of bread did that make? A. One.

699 Q. Oh, you got five hundred and fifteen to 522 grams which makes this one loaf of bread, does it?

A. I baked it in one loaf.

Q. Oh, well, that is because I don't know nothing about grams, I supposed we had a car load of bread here maybe. Then you had just one loaf of each kind, did you?

A. Yes, sir.

Q. And you made just one test of each kind?

A. Yes, sir.

Q. Now, this flour that you performed these experiments with, did you grind it all at the same time? A. I did.

Q. Just as the mill was running?

A. Just as quick as I could make the change.

O. Your bleacher was running all the time, was it?

A. No, sir.

Q. Or have you a way of cutting off the stream before it gets into the agitator?

A. Well, I took my unbleached first, then I started the

bleacher to get this sample.

Q. And did you at that time test the bleached flour to determine the amount of nitrites in it? A. No, sir.

Q. Well, can't you tell this jury anything about the amount of nitrites in there? A. No. sir.

Q. You can't, don't know anything about it? A. No, sir.

You don't know whether there was 1.8 per million or 700 per million? A. No, sir, or a thousand pounds.

Q. You don't know anything about it; you simply know

you bleached it? A. I bleached it.

Q. With this process that you have described?

A. Yes, sir.

And the extent to which it was bleached, or the amount of nitrogen peroxide that was used, you don't know anything about it? A. No. sir.

O. And the amount of nitrites that was embodied in it

you don't know anything about. A. No.

The Court: I don't understand this witness testified he was a chemist, or anything of that kind?

Mr. Smith: No, sir, this may be quite material in determining these tests.

Now, you stored away these different sacks of flour? Q.

A. I did.

And part of them you said were stored in the light; 700 describe that to the jury so we will understand what

you mean by some of them being in the light?

Well, they have a small sack perhaps weighing five pounds of each, the bleached and the unbleached, and I placed them on a shelf in the mill there that there was light and air.

That was in the mill where you were running the bleacher from day to day? A. I was not running the bleacher.

Q. Didn't you run the bleacher after that night?

A. No. sir.

Q. Oh, that is the time you quit running the bleacher, but maybe you don't understand what I mean, I want to make myself plain. At the time that this was stored there in the mill. this five months, I think you said, and some days, yes, five months and eighteen days, I believe you said, was the mill running during that time? A. Yes, sir.

Q. And were you bleaching flour during that time?

A. No, sir.

So the bleaching was entirely discontinued during that five months and eighteen days? A. Yes, sir. That was after you had quit bleaching altogether?

Q. Yes, sir. A.

- And it just stood up there on the shelf in the mill, did it? Q.
- We used it as a mixer, we used the agitator as a mixer. A. Well, where were those with reference to the agitator? Q.

Over the flour bin. A.

And they just stood there on a shelf in the mill during this period of time? A. The flour?

Q. This that you made the experiments with, the sample, but they were on a shelf in the mill, they just stood there on a shelf in the mill for five months and eighteen days?

A. Yes, sir.

Q. And those that you put in the dark, where were they?

A. They were under the flour bin, back of the hopper part.

Q. Well, were they in a box there? A. Yes, sir.

Q. And closed up tight? A. Yes, sir.

Q. Now, how many pounds did you have in each one of those? A. Had about five pounds.

701 Q. About five pounds, and then after the expiration of that time you made these baking tests? A. Yes, sir.

Q. And you took from the sacks that were in the light enough to make one loaf of bread each? A. Yes, sir.

Q. No test was made at that time, of course, to determine

the nitrite contents of either one? A. No, sir.

Q. Did you test either one of them at that time to deter-

mine the amount of moisture in either one? A. No, sir.

Q. Did you test either one of them at that time to determine the amount of starch or gluten in each one?

A. No. sir.

2. You made no test of it at all? A. No, sir.

Q. And did you make any test of that which was in the dark to determine the moisture content of either of them?

A. No, sir.

Q. Nor any other tests? A. No, sir.

Q. Did you personally attend to the baking? A. I did.

Q. And tell us in a general way, please, how you prepared

A. I weighed 340 grams of flour, taking 10 grams of yeast, 12 grams of sugar and 4 grams of salt, and 195 of water, mixing it together in a colander or beater, put it in the expansion case to raise to a temperature of 90, 85 to 90, let it raise, and placed it in an electric oven, and baked it thirty-five minutes.

Q. Did you bake all four of the loaves at the same time?

A. No, sir.

Q. Well, bake them one at a time? A. Yes, sir.

Q. No, two of them, then, were in the oven at the same time? A. Part of the time.

Q. Sir?

A. Part of the time, just the difference that it took me to mix them up and get them to the expansion case and the raising, and from the expansion case to the oven.

Q. You got one started? A. Yes, sir.

Q. And then you prepared another and put it in?

A. Yes, sir.

2. In the meantime one of them had been baking some?

A. Yes.

Q. And then you prepared another one and got it 702 started? A. Yes, sir.

Q. In the meantime the other two had been baking

some?

A. Well, they wasn't all in at once, about two in at once, you see the difference.

Q. I see, so there were two loaves that were in the oven at the same time and the same identical time? A. No, no.

Q. Two of them were in there a part of the time together?

A. Yes, sir.

Q. The one that went in first and of course it came out first?

A. Yes, sir.

Q. And now after you had done all this, as to those that were in the dark, as I have it here, you found the weight on the next test or volume 519 as to 522; I believe that is the one that was in the dark?

A. Which one is it you are referring to now?

Q. The one in the dark; I did not take the figures; I said the weight I think you said of that was 519 for the bleached and 522 for the unbleached? A. In the dark?

Q. Yes, sir.

A. 519 was the bleached placed in the dark.

Q. Yes, and 522 the unbleached, is that right? A. Yes, sir.

Q. A difference of three grams? A. Yes. Q. In the weight of that loaf of bread?

A. Yes, sir, three grams.

By Mr. Butler:

Q. Change in the volume, in weight?

A. No, that is weight.

By Mr. Smith:

Q. In volume each one measured 88 cubic inches, didn't it?

A. Yes, sir.

Q. Just the same in volume? A. Yes, sir.

Q. Now, you never repeated this experiment any other time to see if it would come out the same afterwards?

A. Oh, I have made a comparison bake of unbleached and bleached.

Q. But never with the same flours as you did this?

A. No, not with this same flour.

703 Q. Sir?

A. I baked the bleached and unbleached flour and tested that.

Q. But you never made a comparative test where you used the same degree of care to get your measurements exactly as you did here? A. Yes, sir.

Q. At other times? A. Yes, sir.

Q. Well, now, can you give us those figures?

- A. No, I haven't them, I have no record of them.
- Q. Well, why didn't you keep a record of them?
- A. Well it was when I was bleaching, when I was bleaching right then.

Q. Well, did you make a record of them? A. I think so.

Q. Have you that record with you? A. No, sir.

Q. How many times did you perform that experiment?

A. Oh, probably half a dozen times.

Q. With the same grade of flour? A. Yes, sir. Q. Some of it bleached and some unbleached?

A. Yes, sir.

Q. Using the same degree of care you did here?

A. The same.

Q. But you cannot give us those figures at all?

A. No, this test was made in regard to the aging more than anything else, why I made this test.

Q. Yes, what do you mean when you refer to the texture of the loaf, what do you mean by that?

A. Well, the pores, finer or coarse.

Q. Spongy or coarse, and I believe as you have said you could see no difference? A. No, sir.

Q. And as to the odor, I think you said there was no dif-

ference? A. Could not detect any difference.

Q. And as to the elasticity you couldn't see any difference?

A. Not in the dough.

Q. In the dough, yes. A. No.

Q. What do you mean by elasticity, the way it works?

A. By stretching it the way it works.

Q. As to that you couldn't see any difference?

A. No, I could not detect much difference?

Q. Now, I believe you said as to the gluten you thought that there was a difference in the elasticity when that was washed out?

A. Yes, sir, there is a difference.

Q. I don't know of any food product, do you, that is made out of pure gluten?

A. No, I don't know of anything; I suppose you could buy

pure gluten for bread.

Q. Probably, but your family,—is there any food product that your wife cooks out of pure gluten? A. No, sir.

Q. I don't know of any, do you?

A. No, I don't know of any.

Q. Did you ever at any time wash these different flours and weigh the gluten of each? A. I have.

Q. When did you do that?

A. Most every year the starting of the new wheat.

Q. Well, now, have you ever compared the gluten of the bleached and the unbleached from the same wheat grown at the same time, to ascertain the volume of that gluten?

A. No. I don't know as I ever compared them.

Q. Never did that; you compared different wheats in different seasons and so forth?

A. Yes, sir, that is I never compared them at the same time, understand me.

Q. Yes, sir.

That I never compared the unbleached and the bleached at the same time.

Q. That is what I understood you to say. Now, the wheat that you are grinding up there now is the spring wheat of that section of country? A. Yes, sir.

Q. You are not using any of the wheat that is grown in

Kansas, Nebraska, or Missouri at all? A. No, sir.

Q. You don't know how your flour, then, compares in color with the flour produced from wheat in this vicinity?

A. I do not.

I believe that is all. There is one thing I wish you would explain to us a little further. Your figures were in Can we get that into ounces or pounds, how many grams in a pound? A. 4541/2, I think.

Q. 454 grams in a pound? A. Yes, sir.

Q. So as you use it here the weight of this as you fix 705 it, 419 to 422, was a little bit less than a pound, was it?

The flour?

No, well, I don't know how much flour you took; how much flour did you take? A. 340 grams.

Q. Sir? A. 340 grams.

Q. That would be about a fraction of a pound?

A. Oh, it would be about 12 ounces.

Q. And as you had the loaf baked when it weighed 519 grams, that was a trifle over a pound? A. Yes, sir.

This three grams that they differed would be what part of a pound, would be 3 /454ths of a pound?

A. I suppose so.

I forget how many grams you said to a pound?

A. 454 and 1/6.

Q. About 1/150th of a pound. Now, isn't it true, or do you know whether or not that difference in the baking of bread in the weight of the loaf is within the limits of variation if you had exactly the same kind of bread and baked it twice at the same time? A. Oh, it might.

Q. Two loaves at the same time? A. I don't think so.

By Judge Scarritt:

Q. You said it might?

A. I have baked twenty bakings out of one sack and never varied a pound in volume.

By Mr. Smith:

Q. Now, of this flour you had in the light what was the weight of the unbleached loaf that you got out of that?

A. The unbleached in the light?

Q. Yes, sir. A. 515.

Q. And what was the weight of the unbleached?

A. This is the bleached, 515 is the bleached.

- Q. All right, pardon me, which is that, bleached or unbleached? A. Bleached.
  - Q. And of the bleached you had in the dark was how much.

A. 519.

Q. And those two flours were milled at the same time?

A. Milled at the same time.

Q. Out of the same wheat? A. Yes sir.

Q. So that the difference between those was greater than the difference between the two loaves you had in the dark, wasn't it?

706 A. Yes, sir, there was a little more difference between the two loaves in the light than there was in the dark.

Q. And yet those two loaves of bread were made out of flour that is milled at the same time?

A. Yes, sir.

Q. Bleached in the same way? A. Yes, sir.

Q. Kept exactly the same length of time?

A. Yes, sir.

Q. And baked exactly the same way? A. Yes, sir.

# Redirect Examination

By Mr. Butler:

Q. Now, with respect to the degree of bleaching of these four specimens, two of which were stored or aged in the dark, a period, put under the conditions you have described, and two of which were aged in the light, was it a strong bleaching or a light bleaching?

A. Just light as I could bleach, light as I could bleach.

Q. As light as your apparatus would permit?

A. That is with the one notch of feed.

Q. Yes, sir, I understand, the purpose of that examination was particularly to ascertain the effect of bleaching?

A. Yes, sir.

Q. The others that you did from time to time as you bleached you did not preserve? A. No.

Q. And in those cases the flour was bleached to that degree that you customarily used? A. Yes, sir.

Q. When you said to Mr. Smith that you bleached all except low grades, what percentage of your total edible flour would that be? A. 95 per cent.

Q. And that the clear took more bleach, that is whiter

than, more than the patent?

A. In comparison with the same bleached.

Q. Yes, with the same amount of bleaching re-agent there would be a greater reduction in the clear than in the patent?

A. Yes, sir.

- Q. Because it was darker to start with, I suppose?
   A. Well, there was more yellow, more fat, I suppose.
- Q. Now, what percentage of clear was there, about 15 or 20? A. 20 to 25.

Q. 20 to 25? A. That is of the 95 per cent.

707 Q. Yes, sir, when you said purified middlings what does the word "purified" signify?

A. In dressing the mill with air and bolt slick, taking the

best of them off, grinding them.

Q. What becomes of the substances taken out in this purification or by the purifier?

A. Some of it goes to the feed, some of it to the lower grades of flour.

Q. Some of it goes to the clear? A. No.

Q. To what is called the low grade?
A. To what is called the low grade.

# Recross Examination

By Mr. Smith:

Q. Calling attention, now, to the patent flours, did you make patent flour? A. Yes, sir.

Q. What per cent did you put in your patent?

A. Between 75 and 80 per cent.

Q. Well, what makes the difference?
 A. The wheat, the bearing of the wheat.

Q. You got more patent flour out of one kind of wheat than you can another?

A. Oh, it will vary, you cannot keep right at 85, or right at 80; it is bound to vary about from day to day.

Q. You are making 80 per cent now, are you? A. I wouldn't say that I was making quite 80.

Q. Well, will you say that you are not; you are making about from 75 to 80 now? A. 75 to 80.

Q. Always have done that, have you?

A. Yes, sir.

Q. Ever made more than that? A. No, sir.

Q. But you have always run it up with the straight?

A. Yes, sir.

Q. Now, would there be as much difference between your 80 per cent patent and another man's 55 per cent patent, cor-

respondingly, as there would between an 80 per cent and an 85 per cent patent?

A. How is that?

Q. Maybe I don't make myself plain. Would there be any difference between a 60 per cent patent made out of the same grade of wheat that you are using and your 80 per cent patent?

A. What do you mean in per cent or in grade?

Q. Quality of the flour, quality?

A. Well, I don't know, it depends on where the flour 708 is taken from in the mill.

Q. It depends on where it is taken from?

A. Yes, sir.

- Q. Then you may be able to grind so as to get an 80 per cent patent just as good as a 60 per cent patent?
  - A. I may, it depends on where he takes his 60 per cent. Q. Depends a good deal on the method and the equipment

of the mill and how he runs it?

A. He can take his break flour off and run into patent and make a 60 per cent.

Q. How do you brand this 80 per cent flour that you put

out? A. First patent.

Q. Then do you have some other patent besides?
 A. Have second patent, that is a 95 per cent.

Q. Then you get a 95 per cent flour that you put on the market as a second patent, do you? A. Yes, sir.

Q. How do you brand that? A. Second patent.

Q. Got any name to it? A. Hawthorne.

Q. That is 90 per cent of the entire output of the wheat, is it?

A. No, sir, that is 95 per cent of the output of the flour, taking out the low grade.

Q. What do you call the low grade, what has been denominated here the red dog?

A. Well, we call it low grade.

Q. That is something that you don't use as flour at all?

A. Yes, sir.

Q. That is feed or bran, or whatever it may be?

A. It goes into feed.

Q. The brands, 95 per cent of all of them which you get out are called flour? A. Yes.

Q. And as the second patent you include in that 95 per cent?

A. The second patent is a 95 per cent.

Q. And in the first which is the best flour, you make there at the mill? A. Yes, sir.

Q. You get as high as 80 per cent?

A. Yes, sir, of the 95 per cent, not of the whole amount.

Q. 80 per cent of the 95 per cent? A. Yes, sir.

709 Q. And what becomes of the other?

. It is low grade.

Q. Now, let's assume that you are starting in today to make your highest grade patent? A. Yes, sir.

Q. Now, how many different grades of flour when you are

running your patent?

A. I may start on patent and change over on straight.

Q. Let's not change over, let's assume you are going to run
the mill today to make all patent flour, the best you make.

A. Yes, sir.

Q. Now, how many different kinds of flour will you be making that day?

A. I will be making three with the low grade. Q. By that you mean the red dog, the refuse?

A. Yes, sir.

Q. We leave that out, that is not flour? A. Yes, sir.

Q. So you are having two streams running that you call flour? A. Yes, sir.

Q. One of them is your patent? A. Yes, sir. Q. And what do you call the other? A. Clear.

Q. Now, in that total output of the mill which you call flour, leaving out of consideration the bran and the red dog, because you don't call that flour, yourself, what per cent is put in your patent streams? A. 75 or 80 per cent.

Q. And the balance of it will be in the clear?

A. Yes, sir.

Q. Which would be from 20 to 25 cent of the flour output?

A. Yes, outside of the low grade.

Q. Oh, well you don't call that flour at all, do you?

A. No, no.

Q. Of this which you call flour? A. Yes.

Q. You will run 30 per cent into your patent and you run the balance into your clear? A. Yes, sir.

Q. Of course you get a per cent of bran and other things like that that you don't call that flour at all, isn't that right?

A. Yes, sir.

Q. What do you call your first patent flour?

A. White Rose.

710 Delbert R. Athey, called as a witness on the part of libelant, being duly sworn, testified as follows:

# **Direct Examination**

By Mr. Butler:

Q. D. R. Athey? A. Yes.

Q. What is your first name? A. Delbert.

Q. Delbert? A. Yes, sir.

Q. Delbert R. Athey. Where do you live?

A. Des Moines, Iowa.

Q. What is your business?

A. I am a millwright and also a miller.

Q. How long have you followed those occupations?

A. Since 1889.

Q. Do you know the process called the Alsop process of bleaching flour? A. I do.

Q. Ever install any plants for treating flour by that proc-

ess? A. I have.

Q. Have you seen them work? A. Yes, sir. Q. How many of them have you installed?

A. I have installed six new ones and reset two old ones that have been in use.

Q. Are you familiar with the manner of their use?

A. Yes, sir.

Q. You may tell us whether or not any smell or odor attends operation? How many have you seen work altogether?

A. Oh, I have seen probably thirteen, fourteen different

machines in operation.

Q. You may tell whether or not there are any fumes or the odors of any fumes observable about mills where they are employed there? A. There is.

Q. What has been your experience in that regard; has it been uniform, have you always found it or only sometimes?

A. I always detected that odor wherever the mill was using the bleachers.

Q. And what was the odor; did you get the odor of the gas that came in that bottle marked "Exhibit 6" that Dr. Shepard brought in? A. Yes, sir.

711 Q. And how did the odor compare with that, alike or

different?

A. It would appear it smelled just like that.

Q. Have you been able to observe the effect of the Alsop modified air or NO2 diluted with atmosphere, the thing they use to bleach flour, its effect upon metals, tanks and pipes and so forth? A. Yes, sir, I have

Q. What has been your observation in that regard?

A. Well, it corrodes the tanks and pipe; I have noticed it in two different mills.

Q. Where?

A. One was at Loomis, Nebraska, and the other was at Carroll. Iowa.

Q. Now what was the effect on the tanks, these expansion tanks, I mean whatever it is, this is the tank between the gas generator to the flour shaker?

A. Well, the one at Loomis, Nebraska, was very badly corroded, especially where all the seams up and down the tank and the seams a ound the top and bottom of the tank was

eaten through in places, and it was a continuous rust line around and up and down where the seams were.

The galvanized iron tank was open there? A. Yes, sir.

How long had it been in use? Q. Well, the miller told me-A.

Mr. Smith: I object, this is hearsay testimony, incompetent.

- Had you seen it before? A. No, sir. Q.
- Q. You did not install it? A. I did not, I just reset it.

Q. And you would not know, you were called to put in a

new one or reset it?

A. No, we was remodeling the mill and in remodeling the mill we had to change the position of the agitators in the mill, and consequently we had to change—take down the pipes, and change them also.

Q. Yes. Now about this tank, did you put it back in there

and use it? A. Yes, sir; we left it right where it was.

Well, did you say it was open there? A. It was in places with pin holes,

Well, would gas leak through it all the time, or 712 how about that, could it be used, is what I am trying to get at?

We used it by pasting up those holes with cloth, made a

paste, flour paste.

- Now then you took down the pipes connecting the gas machine too, did you, with the flour shaker and with this tank also?
- A. From the tank to the agitator we took that pipe down. From the tank, but not from the gas machine to the tank? A. No, we did not disturb that.
- Q. How did you find the pipes that reached from the tank to the very place where the flour was shaken in the agitator?

How is that? A.

Q. The pipes that you examined, took down, ran from this tank to the very place where the flour was shaken in the agitator? A. Yes, sir, it went right into the-

Q. Well, how were those pipes when you took them down?

A. Well, they were corroded on the inside and had rust scales and some powdered substances that resembled wood ashes a little bit, but it was mostly of the scaly yellowish color.

Q. And the quantity of it?

Well, we got about, I should judge, a quart of such stuff out of the pipe, about 10 feet long, or approximately that. How big a pipe was it? A. Two inch pipe.

And what kind of metal was it, like a galvanized iron or galvanized tin roof or water spout such as has been referred to in cross-examination of other witnesses, or was it a thick iron pipe?

Judge Scarritt: I object to that as commenting on the testimony of other witnesses, if your Honor please; that is not the proper way to cross-examine a witness.

The Court: Well, tell what kind of pipe it was.

By Mr. Butler:

Q. Yes.

A. Well, it was galvanized iron two inch pipe such as used for steam pipe or water pipe.

Q. Now as respects—did you ever open an agitator while

it was at work? A. Yes, sir.

713 Q. Now tell us whether or not there was any odor of this gas such as was "Exhibit No. 6"?

A. Yes, you could smell the gas when the agitator was

open.

Q. Have you been in the packing rooms where the flour is packed into sacks? A. Yes, sir.

Q. What is the effect in that regard as to the smell?

A. Well, we could smell the gas there.

Q. Now with respect to flour which was exposed either about the spouts or agitator or elsewhere for a long time to this bleaching medium; have you observed any such flour in angles and corners, and so forth? A. Yes, I have.

Q. What was its appearance?

A. Well, it was of a very yellow color, what I call saffron color, and if you took it in your hand you could smell

it, smelled like the gas that goes into the bleachers.

Q. About the mills that you were familiar with where this Alsop process was employed, you may tell whether or not there were necessarily angles there and corners and places where flour would lodge over the bottom?

A. Yes, sir, particularly if the spout in going from the agitator directions at any place, where the direction was changed there would always be a smell there of flour lodged there that

had been there some time.

Q. Yes, sir. Now your flour lodged in such a place as that?

A. Yes.

Q. Turned saffron color and offensive in smell?

A. Yes, sir.

Q. That is after it had passed through the agitator?

A. Yes, sir.

Q. For example, the agitator is so located that the spout running from it to the packing room has a bend or turn in it, then the flour would lodge about the angles or bend or turn in the spout would take on this color, is that it? Counsel for claimant objected to the question as leading and suggestive.

A. That is where it came from.

Judge Scarritt: The only way we can save time is to cut Mr. Butler off from testifying, as I see it.

714 Mr. Butler: Well, let that be stricken out.

Q. Now Mr. Athey, describe the location of these spouts where the flour would accumulate, whether before or after it went in, and all about it, so that we will not lead and will save time and get along, how the flour looked and how it smelled and whether there was much of it or little of it, and whether such things are necessary in mills.

Mr. Smith: The witness has now been thoroughly instructed.

The Court: Go on and answer, go on and answer.

A. Well, in this particular instance at Loomis, the flour came out of one end of the bleacher directly above the floor and there was a straight piece of spout to the floor, and from the floor there was a spout that went angling down to the bottom of the joists, and from there it went, of course, at right angles that way, and right in the right angle turn there was probably, Oh, in the neighborhood of a handful of this yellow flour laying right in there; and I also discovered that there was some of it laying in the bottom of the bleachers. I discovered it in the bottom of the bleacher right where it discharged.

Q. Do you mean the conveyor or the gas machine or the

tank? A. No, the agitator.

Q. The agitator?

A. I had occasion to take the spout off of there and there was flour about half an inch thick laying in right around in the bottom of the circle of the agitator that was of this yellow color also, but not so bad as the one down in the spout.

Q. How much in quantity of that?

A. Well, I scraped out possibly a pint, a pint and a half of it.

Q. Do you know whether or not in ordinary operation more or less flour adheres or condenses upon the wall of the agitator or has your observation ever been such to observe that?

A. It has not.

Q. Have those agitators glass in them that you can look in and see whether the flour is running or whether some of it adheres like a frost or snow or whatever it is?

A. Not the ones that I have seen.

Q. I think that will be all.

#### 715

### Cross-Examination

By Mr. Smith:

Q. Are you a miller or a millwright? A. I work at both.

Q. What is your business now? A. Millwright.

Q. By that you mean you construct mills? A. Yes, sir.

Q. Put them together; you are not a miller now?

A. No, sir.

Q. How long since you have been a practical miller?

A. I quit milling in 1904.

Q. And you are not at the present time engaged in any milling industry at all? A. No, sir.

Q. Now you were never at the mill owned by the Lexington

people? A. No, sir.

Q. You don't know anything about how it is constructed?

A. No, sir.

Q. No two mills, I suppose are constructed alike, are they, exactly? A. No, sir, I have not seen them.

Q. The way these spouts lead, and whether they have angles or joints, would not be the same in any two mills?

A. I should say not.

Q. You never saw two that were alike, did you?

A. No, sir.

Q. And in testifying, what you saw here, you are testifying to what you observed out at the mill in Loomis, Nebraska?

A. Yes, sir.

Q. No building that you have seen in the Lexington mill?

A. No, sir.

Q. You don't know anything about whether they have any of these angles or joints where there would be this stuff collected that you refer to? A. No, I do not.

Q. This would be in angles or joints that lead from the

agitator to where the flour is packed, is it? A. Yes, sir.

Q. The angles or joints that would provide the agitator wouldn't have to do with it would they?

A. I never discovered any there.

Q. It would be such flour as goes from the agitator to the place where it is packed or sacked?

A. That is where I discovered it.

Q. And I believe you said you don't know anything about what the Lexington mill has there? A. No, sir.

716 Q. And you never saw two mills that were exactly alike that way did you?

A. No, I never saw two mills exactly alike,

Q. Now this flour that you observed there you say was saffron yellow? A. Yes, sir.

Q. As Bro. Butler would have it is some like an orange, is it? A. Yes, sort of an orange color.

As pronounced as that; the color is as distinct as that color, orange, is it? A. Yes, sir,

You never saw any flour like that put on the market,

did you? A. No, I never did.

You never saw any flour like that in a sack, did you?

No, sir. A.

Q. And I believe you said it was that-was it in the agitator that you took out a pint and a half? A. Yes, sir.

Q. You cleaned it out, did you?

Where I could reach it in there with my hand in the A. discharge hole, pull it out.

How much was that agitator?

- Why, it was probably about 18 inches in diameter and A. 6 feet long.
  - Q. Round or square? A. Round. Q. And as the mill goes it revolves?

A. The beaters inside revolve.

Q. Pardon me, hand me that glass measure there, we'll see if we can illustrate by that. Now was the agitator somewhat the shape of this glass that I have in my hand?

A. Yes, sir, circular.

Q. And in comparative dimensions about the same as that, its diameter as compared to its length would be about the same as the bottom of this compares to its length?

A. Well, approximately.

Q. About that? A. In proportion to that, Q. Now as that goes, it revolves, does it?

A. No, that does not revolve.

No, you are right, the wheels or the fills on the inside of it go around? A. Yes, sir.

And this is what changes, but the agitator itself is Q.

circular the same as this?

A. Yes, but it remains stationary.

- Q. Yes, sir, that is right, the bleaching mechanism 717 comes in at one end of it, don't it? A. Yes, sir. And the flour also comes in there? A. Yes, sir.

Q. And the flour goes out at the other end?

A. Yes, sir.

And while the flour is passing through with it, the flour, the color is changed? A. Yes, sir.

And from that the flour is drawn off in the spout and

goes to the packer? A. Yes, sir.

What was the inside of that agitator, was it wood or was it lined with metal?

A. Why, the beaters you mean? Q. No, no, the agitator itself?

A. It was galvanized iron on the sides.

Q. On the inside? A. Yes, sir.

Q. Lined with galvanized iron?

- A. No, the sides was made of sheet galvanized iron.
  Q. The whole agitator was made of galvanized iron?
- A. Except the heads and they were cast iron.

Q. It is not wood at all?

A. No wood at all, only on the beaters.

Q. Was there cracks or crevices in the wood where anything could cling to? A. No, sir.

Q. It is just a circular galvanized iron pipe?

A. Yes, sir.

Q. Now particles of flour don't stick very much to the surface of galvanized iron when the agitators are going around pretty lively, does it?

A. It does not stick to the sides, but might cling to the

bottom.

Q. Stick some places to the corners, the crevices?

A. No, there is no crevices there; right where this discharge casting was, for the flour to discharge, there are rivets stuck all through there.

Q. And some of it would cling to the head of the rivets,

is that it.

A. Well, it seemed to come down to as far as the rivets, and then it piled up there probably half an inch deep.

Q. That is where the flour was being drawn off from the

agitator, wasn't it?

A. Well, that has been laying there an indefinite time,

718 I don't know how long.

Q. At the place where you found this is where the flour reaches the agitator to go to the packer?

A. Yes, sir, right at the edge of that.

Q. Now, the pipe which you examined was the pipe running from the reservoir to the agitator? A. Yes, sir.

Q. You say there was a pipe such as used in conveying water around the house where the plumbing is bad?

A. Commercial two inch galvanized pipe, that is what it

Q. About how big was it in diameter?

- A. Why, the inside diameter was 2 inches possibly a little more.
  - Q. And in that you found some rust I believe you said?

    A. Well, it was, yes, it was a sickly rusty looking ma-

terial.

Q. And like ashes?

- A. And there was some powdered stuff that resembled wood ashes to a certain extent.
  - Q. Resembled wood ashes, light color?

    A. No, it was more of that gray color.
  - Q. Well, that is light color, isn't it?

A. Well, yes, sir.

Q. You would describe it as a gray color, would you?

A. Yes, sir.

Q. Now did you notice that color particularly so that you know that it was gray?

A. Well, I know it was gray, but I could not-

Q. It was not as dark as that bottle of ink, was it?

A. No, sir.

Q. Was it as gray as that blotter?

- A. Well, it was of a darker gray than that blotter. Q. It was a darker gray than that? A. Yes, sir.
- Q. How would it compare with this piece of board over there?

A. Well, they are more of a yellow cast.

Q. Do you see anything around here that you can compare its color with that you can think about what it is?

A. Well, that approaches it the nearest, although as I re-

member it was a little darker than that yet.

Q. That is some sort of a chaff or bran out of the wheat, isn't it, and it is more the color of bran, was it?

A. Well, some wheat bran but it wasn't—Q. You say it was about the color of that?

719 Q. You say it was about the color of that?

A. Yes, but if I remember right, it was a little bit darker, a little bit darker than that, and it wasn't as coarse as that, it was of a finer—

Q. No, I suppose not. Do you know how long that mill had been running before you went there?

A. Well, I guess it had been there—

Q. Well, do you know anything about it, that is what I am getting at?

A. Only what I was told.

Q. You never had been at the mill before?

A. Never before.

Q. And how long were you there?

A. Seven or eight weeks.

Q. You were there for the purpose of installing another mill or remodeling that mill?

A. I took out the roller mills, the old roller mills, and put in new ones and restored the mill.

Q. That was the purpose for which you were there?

A. Yes, sir.

At this point the further hearing of this cause was adjourned until 2 o'clock p. m.

Thursday Afternoon, June 9, 1910.

Pursuant to adjournment taken as above noted, court met, at two o'clock p. m., Thursday, June 9, 1910, and proceeded with the trial of said cause, further as follows:

Charles J. Wolaver, called as a witness on behalf of the Government, being first duly sworn, was examined and testified as follows:

### Direct Examination

By Mr. Butler:

Q. Where do you live? A. Muskogee, Oklahoma.

720 Q. And your business, Mr. Wolaver?

A. Flour business.

Q. As a merchant, or broker?A. As a broker, and buyer.

Q. Have you ever had any experience, as a miller, as a manager of a mill? A. Yes, sir.

Q. You are not a journeyman miller, by trade?

A. No, sir.

Q. Are you a mechanic? Have you had any mechanical education? A. Yes, sir.

Q. And what is your trade, or what mechanical education, —along what lines? A. Installation of machinery.

Q. You were a machinist, by trade? A. Yes, sir. Q. How long since you were manager of a mill?

A. Flour mill?

Q. Yes. A. About three years.

Q. What was the mill, and where was it located?

A. Purcell Mill & Elevator Company, in Purcell, Oklahoma.
Q. Did that mill bleach its flour, while you were its man-

ager? A. Yes, sir.

Q. What process, or bleaching medium was employed by that mill? A. The Williams process.

Q. Are you familiar with the turkey hard wheat?

A. Yes, sir.

Q. And the yellow berry that is sometimes found in it?

A. Yes, sir, to some extent.

Q. What do you say as to the quality of this yellow berry, assuming that turkey red, with turkey hard wheat, had ten to thirty per cent of yellow berry in it? You may state whether or not that is in truth and in fact, first quality, hard wheat.

A. No, sir.

Mr. Helm: We object to this, as calling for an opinion and conclusion of the witness.

The Court: You may answer.

A. (Continuing) No, sir, I would not consider it a first quality hard wheat.

By Mr. Butler:

Q. It is not so considered in the trade? A. No, sir.
Q. What is a patent flour? A. You mean, what—

721 Q. (Interrupting) What is meant by the term "patent flour"?

Mr. Helm: We object to that, if Your Honor please, for the reason it is shown by the testimony so far that there is no patent flour, as distinguished from all other flours.

The Court: You may answer.

A. My opinion of the patent flour is flour made from best particles of the wheat—purified middlings.

By Mr. Butler:

Q. Did you hear the testimony of Mr. Overton Tucker who milled the flour that was seized in this case? A. No, sir.

Q. Can you tell as whether or not, a ninety-per-cent patent can be made from wheat consisting of turkey hard, in which there is ten to thirty per cent of yellow berry?

A. I don't think so.

Q. Did the Purcell Mill & Elevator Company, when you were its manager, before it commenced bleaching, with this Williams process, make a patent flour? A. Yes, sir.

Q. What per cent?

A. About sixty per cent. Sixty to sixty-five.

Q. Sixty to sixty-five per cent? What kind of wheat was used? A. Oklahoma soft wheat.

Q. And after you commenced bleaching, did you use the same kind of wheat? A. Yes, sir.

Q. What percentage of patent, then?

A. We increased our percentage of patent up to eighty-five and ninety per cent.

Q. From the same kind of wheat?

A. Same kind of wheat.

Q. And, by the same milling method, except that you in-

creased the patent? A. Yes, sir.

O. What effect did the bleaching have upon the appearance of the long patent, as compared with the appearance of the short patent, before you bleached it? A. Made it as white.

O. From your experience with bleaching flour, can you tell us whether or not the quality of the flour is improved by bleaching?

Mr. Helm: We object to that as calling for a conclusion.

The Court: Objection overruled.

722 A. I do not think it is.

Mr. Scarritt: I don't believe Your Honor understood the question.

The Court: He asked if the quality of the flour is improved by bleaching?

Mr. Scarritt: Yes. That is the very proposition that the jury is to decide.

Mr. Butler: On the evidence.

Mr. Scarritt: Not on his opinion.

Mr. Butler: But they can take it into account.

Mr. Scarritt: No, they cannot.

Mr. Butler. I thought the court so ruled.

Mr. Scarritt: It is an improper hypothetical question. He is stating it as a fact, and not an opinion.

By Mr. Butler:

Q. Well, as to the flour made by the Purcell Mill & Elevator Company, that you observed, you may tell us whether or not, in your opinion, the bleaching improved the hard wheat flour. A. The quality? It did not:

Mr. Scarritt: Same objection.

The Court: Overruled.

Mr. Scarritt: We save an exception.

By Mr. Butler:

Q. Have you been able to form any opinion as to whether or not it injured it, from your examination?

Mr. Scarritt: Same objection.

The Court: Overruled.

Mr. Scarritt: Claimant excepts.

A. I am of the opinion that it did, to a certain extent.

By the Court:

Q. Did what? A. Injure it.

By Mr. Butler:

Q. In case of bleaching, to various degrees—light bleaching, medium, and heavy or over-bleaching—what is the comparative effect upon color?

A. The more you bleach the flour, the whiter it gets.

Q. The output of your mill found market in what trade and for what purpose?

A. Southern Oklahoma, and Texas, to the retail grocers.

Q. Did you, yourself, make any comparison of biscuits made from the sixty per cent patent, of the kind you were making before you commenced to bleach and of the ninety per cent patent after you bleached to see how the color of the biscuits from the ninety per cent patent, bleached, compared with the sixty per cent patent, unbleached? A. Yes, sir.

Q. Where did you make that experiment?

A. Made it at home.

Q. Was it made by the ordinary method employed in your house? A. Yes, sir.

Q. And no matter of weighing or anything of that sort?

A. No, sir.

Q. Just for the simple purpose of showing the relation of color? A. Yes, sir.

Q. What did you find?

A. I found there was very little difference in the color.

Q. You found there was very little difference in the color? Can you tell us which was of the lighter, or more white color?

1. The bleached was the lighter, and more white. The

unbleached had a creamy cast to it.

- Q. During the time that you continued to bleach, what percentage of patent did you maintain?
  - A. During the time that we bleached?Q. That you continued to bleached, yes.

A. From eighty to ninety per cent.

Q. From your observation of this bleached flour, have you been able to form an opinion as to whether bleached flour improves, after bleaching to the same extent as does unbleached flour? A. Yes, sir.

Q. And whether it improves, at all? A. Yes, sir.

Q. What is the fact in that regard?

A. It does not improve, in my opinion.

724 Q. In the trade which you supply in the absence of bleaching, or before bleaching what value, if any, did color have as an index to quality?

A. It was the index to quality, in the trade. We sold to

the trade that—what we called a biscuit trade.

Q. And the color, you say, was the index?

A. Was the index by which we sold the most of our flour.

Q. What is the truth, as respects that matter, with bleached flour—flour that has been bleached?

A. We was able to supply the same trade with our product after bleaching in the bleacher and increasing the per cent of patent.

Q. Now, as respects quality of bleached flour-

Mr. Scarritt: (interrupting) Did you ask what the color of it was—the whiter it was the better?

Mr. Butler: Yes, other things being equal, whiteness indicated better grade. That is what you mean?

Mr. Scarritt: Yes.

By Mr. Butler:

Q. I say, in the absence of bleaching, other things being equal, the color indicates the better flour—whiter color, or lighter color indicates the better flour?

A. Yes, in the absence of bleaching.

Q. Yes? Now, what I wanted is to contrast that with the situation, or compare it with the situation, for bleaching—in the cases of bleached flour. Does whiteness indicate anything, as respects quality, and if so, what?

A. Yes, sir, it does.

Q. In the case of a bleached flour? A. Yes, sir.

Q. Now, how is that?

A. Because we sold our flour, practically on its color.

Q. Yes? That is, the patent and high grade?

A. We supplied the same merchants.

Q. Well, now, what is it you mean by that—does the whiteness of bleached flour, in truth, indicate anything or does it simply make it look like the high grade flour which is not bleached? That is what I am trying to get at.

A. [I] makes it look like a high grade flour, so that we

was able to hold our trade.

725 By Mr. Scarritt:

Q. That is, your trade wanted a white flour, as I understand. A. Wanted a white flour, yes, sir.

By Mr. Butler:

Q. Now, respecting when you made a sixty or sixty five per cent patent flour, when you were milling there before you commenced to bleach—sixty and sixty five per cent patent flour—did you also make it clear?

A. We made what we called a baker's—same thing as a

clear.

Q. Yes? That is what is meant, by some of the others here who use the balance after the patent is taken out, and call it a clear, and you call it a baker's? A. Yes.

Q. What is the color of the baker's as compared with the

patent, before bleaching? A. Darker.

Q. How is that? A. Darker.

Q. Now, what effect upon appearance would be produced by bleaching of the baker's grade, and leaving the patent unbleached?

A. We could bleach the baker's grade until it was as white as the patent unbleached.

Q. Bleaching would bring that to the whiteness of the patent? A. Yes, sir.

Q. And that is the case of winter, soft wheat?

A. Yes, sir.

Q. And I understand that the winter, soft wheats, naturally make a very white flour. Is that right?—as compared with hard wheats. A. With the hard wheats, yes, sir.

Q. Either the hard, winter wheat, or the hard spring wheat?

A. Yes, sir.

So, as a class, the winter soft wheats produce the whiter

flour, do they not? A. Yes, sir, unbleached.

Q. Unbleached? Did you ever observe any flour in your mill that was over-bleached, or subjected too long to this bleaching gas? A. Yes, sir.

Just describe to the jury your experience in that re-

gard.

726 A. After we had the bleacher in, for about-

(interrupting) Speak loudly.

(continuing) About a couple of months, we had some flour returned to us because it contained some yellow flourvery yellow, and also some green specks, and we went out,at least I went out and investigated it and we took the top off of the conveyor, and we found that the flour that had deposited in parts of the conveyor, that the conveyor did not take it out, turned yellow. And also we used to connect the rubber hose to the conveyor, a brass coupling. It seemed that the gas coming in contact with that brass coupling made a green substance.

Mr. Helm: Mr. Witness can you speak a little louder? We can't hear a word.

(continuing) We found that the gas coming in contact with this brass coupling made a sort of green substance that lodged in the conveyor, and would break loose in chunks and go out into the flour. After that we had to clean out the conveyor about once every week.

By Mr. Butler:

Q. You say the effect of this gas coming upon some of the fastenings to the hose was to produce a green substance?

A. Yes, sir, it was a brass coupling.

Now, as to the yellowness produced in the flour that was subjected too long to that, about how yellow was thatthis flour that was returned, for example?

A. Well, it has been described, about as yellow as sulphur,

and I think that is right.

Q. About the color of sulphur? A. Yes, sir.

Was this Purcell Milling & Elevator Company still bleaching when you left it? A. Yes, sir, still bleaching.

Q. When did you leave it? A. I left it in 1907.

Mr. Butler: I believe that is all.

### Cross-Examination

By Mr. Helm:

Q. Your name is Wolner, you say? A. Wolaver.

Q. How do you spell it? A. W-o-l-a-v-e-r.

Q. Where do you now reside?
A. Muskogee, Oklahoma.

727 Q. And what is your present business?

A. My present business is a wholesale flour or brokerage business.

Q. At Muskogee? A. Yes, sir.

- Q. How long have you been in that business? A. Been in that business since January, 1909.
- Q. You have not been in the milling business for the last three years?

A. I have been in the milling business, but not in the flour

business?

Q. You have not been manufacturing flour?

A. Not flour, no, sir. We are manufacturing—I erected a plant in Muskogee, and we manufactured grain and feed and handled feed and corn meal and such things.

Q. You are in that business now?

- A. No, I am not connected with that.
- Q. What was your position with the Muskogee mill?

Mr. Butler: Purcell mill?

Mr. Helm: Purcell mill.

A. The Purcell mill?

Q. Yes. A. I was manager of the mill. Q. You were not the miller? A. No, sir.

Q. You were not the practical miller, yourself?

A. No, sir.

- Q. Your business was to act as the business manager, was it?
  - A. Business manager and to superintend the mill, as well.
- Q. You employed the help and bought the wheat and sold the output? A. Yes, sir.

Q. How long were you in that position?

A. About five years.

Q. Were you in the bleaching business during that five years? A. Not all the time?

Q. How much of the time?

A. We put the bleacher in in the spring, I think of 1905 and used it in 1905 and '6, up to the time I left in 1907.

Q. Then, you left the mill?

A. Yes, sir, it was still in there.

Q. Where did you get your supply of wheat which you used?

A. From Oklahoma and Kansas. Some from Northern Kansas, when it was scarce in Oklahoma.

728 Q. For the benefit of the jury, you may state where Purcell is located,—in what part of Oklahoma.

- A. Purcell is located in the southern part of Oklahoma on the Santa Fe railroad, about thirty miles south of Oklahoma City.
  - Q. And how far from the Texas line?

A. I think about one hundred miles.

- Q. About one hundred miles north of Texas?
- A. About one hundred miles north of the Texas line, yes.
- Q. You put in a Williams process, you say?

A. Yes, sir.

Q. And what was the capacity of your mill?

A. About six hundred barrels.

- Q. Did you run it to its full capacity during that time?
- A. Not all of the time, sometimes we ran half the time, sometimes full time, sometimes a day or two out of the week.
  - Q. Did you have the mill shut down any of the time?

A. Yes, sir.

Q. What portion of the time?

A. It is pretty hard to say; depending on the trade. In a busy season we ran all the time. When the trade was down we ran, sometimes two or three days in the week and sometimes day time.

Q. Your product was marketed in the South, you say?

- A. In Southern Oklahoma and Texas and some in Louisiana.
- Q. Now, your experience in the using of this bleacher, was, you say, you increased your percentage of patent? Is that so?

A. Yes, sir.

Q. Did you make any change in your mill machinery?

A. No, sir.

Q. How do you ascertain the patent flour in an ordinary mill? How do you make different grades of patent with the same machinery in the same mill?

A. Well, I generally leave that to the miller, he has a

standard to mill by.

729

Q. You don't know anything about that?

A. Oh, yes, I know something about it, but I didn't do any of that myself.

Q. Can you describe to the jury how you could make a sixty per cent patent with a mill equipped in a certain way, and make a ninety per cent patent with the same mill, equipped

the same way? A. Yes, I think so. Q. Tell the jury how you would do that.

A. Without bleaching we, of course, took certain streams of flour, that go from the different machines and

throwed them into what we called our patent flour. Of course, we take just as much of it as we possibly could, to keep it up to a certain standard of color and quality.

Q. Now, let me interrupt you just there. Now, that flour

had a certain standard of color, didn't it?

A. That patent had a certain standard of color, yes.

Q. And you associated your color with your patent flour? That was your standard, wasn't it?

A. That was our standard.

Q. Now, what was your color? Describe it to the jury.

A. Well that was white.

Q. Was it a pure white, or, as has been described by many of the witnesses here as a creamy white?

A. Well, a creamy tint, but not so much as would be if we

were milling hard wheat or making hard wheat flour.

- Q. That is the wheat you were using was softer wheat?

  A. Softer wheat and we were milling it down softer.
- Q. But it had a creamy tint? A. Slightly so.
  Q. Slightly so? A. An expert could detect it.
- Q. Now, after you were bleaching the same flour what color would it be? A. White.
  - Q. It would lose its creamy tint?

A. A part of it, yes, sir.

Q. All of it?

A. I don't think it did. It would depend on how much we bleach it—to what extent.

Q. Well, as you ordinarily bleached it for your trade?

A. We intended—the miller had a standard to go by, and we intended to mill to that standard in regard to color and to bleach in proportion.

Q. And it did have a white color, didn't it, after it was

bleached? A. Yes, sir.

Q. And was it a different color from the same flour before it was bleached? A. Different from the same flour?

Q. Yes. A. Oh, yes, it was whiter. Q. It was whiter? A. Yes, sir.

730 Q. It was whiter? A. Yes, sir.
Q. You could tell the difference between the bleached and the unbleached patent flour, couldn't you?

A. Of the same per cent?

Q. Well, of the same flour? A. Yes, sir.

Q. Now, when you were making that sixty per cent patent flour, what other grades of flour were you making?

A. We were making baker's grade.

Q. What per cent?

- A. Sixty per cent of patent to thirty eight per cent of baker's flour and two per cent of low grade.
  - Q. Two per cent of low grade.

A. Yes, We just took off enough to clear up the baker's flour.

Q. So you were making a sixty per cent patent and thirty eight per cent of—what did you call that?

A. Baker's? We called it baker's.

Q. Is that what is ordinarily called a clear flour?

A. That is what they have been calling a clear flour here,

yes, sir.

Q. Now, was there a difference in color between that baker's flour, and the patent flour, as you manufactured it, there, before you bleached it? A. Yes, sir.

Q. A distinct difference?

A. Yes, sir, when you took the two together.

Q. You could tell it? A. Yes, sir.

Q. Anybody could tell it? A. Yes, sir.

Q. And did you bleach this clear? A. Yes, sir.Q. Did you bleach the patent? A. Yes, sir.

Q. Did you bleach all of it?

A. Didn't bleach the low grade.

Q. Didn't bleach the low grade? Now, you bleached it all? A. Yes.

Q. And did you bleach them all at the same time when you were milling them? A. Yes.

Q. From the different streams? Then how did you adjust your machinery so as to get a larger per cent?

A. I don't understand what you are getting at.
 731 Q. You took out sixty per cent in the first place?

A. Yes, before we bleached it.

2. And thirty eight per cent baker's?

A. That was before we bleached it.

Q. Now, you had your machine set so it would divide your grades in those proportions, did you not?

A. At that time.

Q. Now, what did you do to change the proportion that

you received from that same flour?

A. We took streams of flour that we had going into the baker's before we bleached it, and turned them into patent, after we bleached it—that is, after we begun bleaching we took these streams of flour that formerly went into the baker's—and turned them into the patent flour.

Q. But you bleached it all-patent, and baker's, did you

not? A. Yes, sir.

Q. And made simply the one grade out of eighty per cent of the wheat?

A. Oh, we made two grades then.

Q. Yes, but that, you called patent?

A. Yes, eighty to ninety per cent patent.

Q. Now, did that flour have a different color from that sixty per cent patent? A. Unbleached?

Q. Yes. A. Yes, sir.

Q. Distinct difference in color? A. Yes, sir.

Q. You could tell the difference?

A. Yes, sir, unbleached.

- Q. And you are a flour dealer? A. Yes, sir.
- Q. Nobody could fool you that way, could they?
  A. Between sixty per cent and eighty per cent?

Q. Yes. A. I don't think they could.

Q. You could tell the difference? A. Yes, sir.

Q. And how did you brand it?

A. Branded it patent.

- Q. Before you bleached it and after you bleached it?
- A. Yes, sir. Didn't change the brand on our sacks.

  Q. What did you brand your second grade, or baker's?

A. We branded that baker's.

Q. Did you use the word "Patent"?

A. I think so, then, but afterwards it was discontinued.

Q. But you did brand that baker's flour, patent flour, didn't you?

A. Yes, a long while ago. We quit that, though.

Q. Well, you haven't been in the milling business for three years? Did they brand it with the word "Patent" before you left?

A. No, sir. I quit branding it,-left it off the sacks.

Q. Off of the sacks.

A. Yes. On the high grade, we still kept the word "Pat-

ent". I think we used "High Patent."

Q. You didn't intend to brand anything "Patent" that wasn't patent, did you? You were conducting a square, legitimate business, weren't you?

A. I branded our best grade of flour "Patent".

O. And you thought it was patent, didn't you?

A. Well, it was patent so far as the quality compared with what other mills were putting out. Branded the same way. My opinion of patent flour and what we put out in the trade as patent flour, is a different proposition.

Q. But you called it a patent?

A. We called it a patent, yes, sir.

Q. And you thought it compared with what other people were putting upon the market as patent flours?

A. I knew it did.

Q. You knew it did? A. Yes, sir.

Q. You know that some patent flours with even higher percentages are still called patent, don't you?

A. No, sir.

Q. You tried to make it just as high as anybody and called it "Patent"? A. Yes, sir.

Q. Now, you said you put out some bleached flour that was rejected? Is that right? A. Yes, sir.

Q. How much of it?

A. I think, in that lot, there was about ten or twelve sacks.

Q. About ten or twelve sacks?

A. Yes, that time.

Q. And you say that looked like sulphur?

A. No, I said that-

Q. (interrupting) Wasn't that what you told Mr. Butler, that that flour looked like sulphur? A. No, sir.

Q. I must have misunderstood you then.

A. You certainly did.

733 Q. What did you say?

A. I said that it had some spots in it that were yellow.

Q. Only had spots in it? A. Yes, sir.

Q. What part of it was yellow?

- A. Perhaps there was a deposit of one ounce in that, in spots, that was yellow. I examined the whole sack after it came back.
  - Q. Now, that flour wouldn't go on the market?

A. No, sir.

Q. And you would not buy that kind of flour?

A. No, sir, and I wouldn't put it out.

Q. You wouldn't be fooled by that grade of flour, would you? A. Certainly not.

Q. You would reject it? A. Certainly.

Q. And if you were a miller, and found such flours that had gotten into the trade, you would immediately replace it with good flour, wouldn't you? A. Did do it.

Q. It was the result of an accident, wasn't it?

A. No, sir.

Q. Was it intentional on your part that that got out?

A. No, sir.

Q. How did it get out, then?

A. It got out by reason of this accumulation of this flour. that we found by investigation, afterwards, that accumulated in the conveyor where we bleached the flour?

Q. But you didn't intend to put that flour on the trade,

did you? A. No, sir.

Q. And immediately furnished other flour? A. Yes, sir.

- Q. Now, it was due to the fact that you did not properly clean out the mill, wasn't it, that that flour got into that sack?
  - A. I don't think so.

Q. Don't think so?

A. Because we kept our mill thoroughly cleaned.

Q. Did you ever have this experience any other time?

A. No. sir.

Q. And how long a time, you say, you were there—three years? A. About five years.

Q. Five years? A. Yes, sir.

734 Q. And you had one shipment in which there was complaint about this yellow flour?

A. That is the only one I remember of.

Q. Now, you weren't manufacturing that kind of flour, generally, were you? A. What kind of flour is that?

Q. This yellow flour, and putting it upon the trade?

A. Not intentionally.

Q. Well, you didn't do it, because it didn't come back?

A. It didn't come back. We had no complaint.

Q. That was the only shipment?

A. That was the only shipment.

Q. And you say it was the only complaint?

A. That is, the only complaint, I said, that I remember of

in regard to that particular fault.

Q. Now, it is a fact, is it not, that more or less of dirt of various kinds will accumulate in a mill, during its operation?

A. Yes, sir.

Q. And there will be particles of flour scattered about in different parts of the mill, or will accumulate dirt and filth, and be unsalable, if put upon the market, won't there?

A. Oh, we kept the mill clean.

Q. Well, I will ask you, if that isn't true, generally, in the milling industry?

A. We didn't take the flour out of the corners of the mill

and put it on the market, no.

Q. You wouldn't take this colored flour that had collected in some part of your machinery and put it on the market?

A. No, sir.

Q. And if you kept your mill properly cleansed, it would not be there, would it?

A. It was not there after we discovered what it was caused it.

Q. You cleaned it, after that? A. Yes, sir.

Q. Then the fact that it was there was due to not cleaning

before, wasn't it?

- A. We didn't know it would accumulate there, before we discovered it. If we had known it would accumulate there, we certainly would have cleaned it out.
- Q. Now, do you know of any standard that is recognized by the government or by any state, or by any official body, anywhere, as to what is a patent flour, and what is not a patent flour? A. No, I don't.

Q. How is that? There is no standard is there?

A. I know of no official standard.

Q. Practically every miller has his own standard, doesn't he? A. No, I don't think that.

Q. How is that? What standard do they have, then?
A. I think there was an attempt made by the Kansas mill-

ers to make a standard for patent at one time.

2. They didn't succeed with it, did they?

A. Yes, they did, for a while. They put out a sixty or sixty five per cent patent, and put a stamp on their sack, indicating that that flour didn't contain over sixty or sixty five per cent. I don't know whether that is discontinued, or not.

Q. You don't know whether that is in effect, today, or

whether it ever got into effect with all the mills?

A. In buying flour, it was my understanding, when I bought flour of that particular brand on, or number, that it was sixty or sixty five per cent.

Q. Well, you had that understanding? A. Yes.

Q. But you don't know of any government test, or any state test or any test that could be used as a standard that all millers could observe in making patent flour, do you?

A. No, sir.

Q. Never has been such, in the milling business, has there?

A. I don't know of any.

Q. What experiments have you made, as a dealer in flour, to determine whether flour is bleached or unbleached? Can you always tell when it comes to your market? A. No.

Q. You can't tell?

A. No. Not by looking at the flour, unless I know that one sample is bleached, and the other sample unbleached.

Q. And you can't tell whether it is improved or unimproved,

' can you?

A. I could, by baking it out, I presume, or I can by examining the flour.

Well, you have never conducted any baking tests, have you? A. Not since I have been buying flour, no.

736 Q. And did you when you were milling?

A. Yes, sir.

Q. For what purpose? To test the quality of the grain you were grinding? A. No, sir.

Q. How?

A. No, sir. After I put the bleaching in, I made some baking tests, in my house, of biscuits, comparing the color between the flour that I made, without bleaching it, and as I increased the per cent of patent.

Q. And you say there was very little difference?

A. Very little difference.

Q. But you stated there was quite a little difference in the flour which you could distinguish in color, between the bleached and the unbleached? A. Yes, sir.

Q. But you couldn't tell that difference, in the biscuits?

A. In the baking?

Q. After they were baked—in the biscuits.

A. Take the two together, I could see a slight difference. Take one at one time, and one at another, I could not tell the difference.

Q. So the difference was there?

A. A very slight difference.

- Q. You could tell which was the bleached flour biscuits and which was the unbleached flour biscuits?
  - A. I couldn't tell unless I looked at them together.
- Q. Now, could you tell, from anything about that, either color, taste, smelling, or acceptability, or anything else?

A. No, I was only testing as to color.

- Q. And you say you could tell the difference, by comparing the two together? A. Yes, a slight difference.
- Q. Now, you spoke something about pipes. What kind of a pipe did you use to connect your machine?
  - A. To convey the gas from the generators to the jars?

Yes. A. Used a rubber hose.

Q. What was the size of that rubber hose?

A. An inch and a half.

- Q. An inch and a half? A. Yes, sir.
- 737 Q. And you used it how long?

A. About five or six weeks.

Q. Five or six weeks? A. Yes.

- Q. And did you use anything else besides this rubber hose?
- A. No, sir. I had to renew it every five or six weeks. I bought hose in quantities and kept it for that purpose.

Q. It would get dirty, wouldn't it? A. No, sir.

- Q. Nothing in there at all? Now, what other conveyance did you have besides this hose? Did you have any iron pipes, anywhere?
- A. The only iron pipe I had was, taking the air from the outside to the fan. I blew the air into the jar containing the nitric acid.
- Q. Did you have an agitator? A. I had a conveyer.
  Q. Well, did you have an agitator, of any kind, to mix up and bleach the flour? A. We used the conveyer.

Q. You didn't have an agitator, at all?A. We used a conveyer for an agitator.

Q. What is a conveyer? Explain that to the jury.

A. That is a spiral, iron shaft, in the box that conveys the flour from one point to another, and mixes it up as it conveys it.

Q. Did that convey it direct to the packing room?

A. Direct to the spout leading to the packing bin, yes, sir.

Q. So that you didn't dilute this gas with any intermediate box, such as a tank? A. No.

Q. Or didn't even use an agitator?

A. Used a conveyer for an agitator, which has the same effect.

Q. Well, you didn't use an agitator, such as you have heard described here?

A. No. We didn't have any such thing specially built.

Q. Didn't have such a thing in the mill at all?

A. No, We just used the conveyer.

Q. You were not the miller, but the manager of that mill?

A. I was not the head miller, no.

Q. So far as you know, the mill is still using this, isn't it?

A. So far as I know, the bleacher is still there.

Q. You haven't any interest or connection with the mill? A. No, sir.

Q. Haven't had for three years? A. No, sir.

Q. Never had put the one complaint that you can now re-

A. One complaint in regard to the flour containing this deposit of yellow?

Q. Yes? That is all?

A. That is all, because, after that, we kept it clean.

## Redirect Examination

By Mr. Butler:

Q. Did yellow flour accumulate around your mill, at all, in these spouts, before this bleaching? A. No, sir.

Q. But, after your bleaching, and your discovery of it,

you cleaned it out?

A. Cleaned it out, and kept it cleaned out—cleaned out every week.

Q. Now, how yellow would it turn in a week? That is what

I am trying to get at.

A. Oh, about as yellow as sulphur.

Q. And this was not dirt that was floating about around the mill? This was flour that was on its way to the packing room? A. That was flour.

Q. You told Mr. Helm that, by ordinary observation, and without a standard of comparison, you cannot tell whether flour is bleached or not. A. I could not, no, sir.

Q. Do you know of any one who can?

A. No, I do not.

Q. You are, now, a broker in flour? A. Yes, sir.

Q. When did this association of millers, in Kansas, who established the sixty five per cent patent, start?

Mr. Scarritt: I object to that as immaterial.

Mr. Butler: Well, it was called out in cross-examination.

Mr. Scarritt: No. It was not in answer to any question.

Mr. Butler: Yes, Judge Helm asked him.

Mr. Helm: I simply asked him if there was any official standard.

Mr. Butler: I know, and then you got too long.

Mr. Smith: It would not be binding on this defendant.

739 Mr. Butler: No, but I wanted to find out what they were talking about. Does your Honor sustain the objection?

The Court: No, I did not.

A. It is my understanding, about three years ago.

By Mr. Butler:

Q. And some of the bags were branded to indicate it?

A. Yes, sir. My understanding was that they put a cash guarantee that it was so much,

Q. That is, in the turkey hard wheat territory?

A. Yes, sir.

Q. Now, in cross-examination, you were interrogated somewhat closely as to the percentage you put in your patent before and after you commenced to bleach, and, as I caught your answers, it was stated that, after you commenced to bleach, you had about eighty five to ninety five per cent—whatever it was—and, you say that corresponded with the percentage of patents put out by other millers?

A. Yes, as I understood it. Those who were bleaching.

Q. Who were bleaching? A. Yes, sir.

Q. Now, before you commenced to bleach, did your patent, then of sixty five per cent correspond with the patents put out by the other millers, who were not bleaching?

A. We were able to hold our trade did hold it. But we couldn't make our per cent any higher than that, on the patent,

and hold it.

Q. And compete with the other flour? A. No.

Q. So then, the situation is, before bleaching, your patent corresponded—

Mr. Scarritt: (interrupting) I object to his arguing this over again, if our Honor please.

Mr. Butler: I will withdraw the question, Judge Scarritt, if you are going to get up. I am going to stop you from making these speeches, if I have to withdraw every question.

Mr. Scarritt: You will not have to withdraw many. If you keep in line, I will.

Mr. Butler: All right.

The Court: Are you through?

Mr. Helm: I want to ask another question that was brought out by the redirect, of Mr. Butler: 740 Q. You say it took a week to accumulate this yellow flour you speak of? Is that right?

A. I said we cleaned out the conveyer every week, after

that.

Q. I know, but he asked you how long it would be before that would accumulate there. I understood you to say about a week.

A. Of course, every time we cleaned it out, we found some

of that yellow flour, that had accumulated there.

Q. Now, how long had you been running your mill before you had this complaint? A. You mean from bleaching?

Q. Yes, from the time you started in.

A. About five or six weeks.

- Q. And it was before you learned how to handle the process?
- A. Before we learned what effect the bleaching process would have on the flour that remained in the conveyer.
- Q. Did you have any means of regulating and gauging the amount of this gas that you would blow upon that flour?

A. Yes.

Q. And do you know whether or not that was not produced by that entirely—the gas, itself, blowing in there?

A. Know that it was not?

Q. Yes.

A. Oh, yes. I know that would be impossible, the way we had it arranged.

Q. Would be impossible? A. Yes.

Q. Well, it was only about eighteen inches from the generator, wasn't it, to your conveyer?

A. Oh, no. About twenty-five feet, I should think.

Q. You didn't have the flour separated from this generator several feet—twenty-five to a hundred feet, as some of these millers have testified, from the place of the generator, but had it only eighteen inches, as I understand, from the generator to the flour. A. Oh, no.

Q. What was the length of your hose?

A. About twenty-five feet.

Q. It went into the conveyer? A. Yes, sir.

Q. And the flour was run through there?

A. Yes, was in the conveyer-about twenty-five feet.

741 Q. Describe a little more particularly where this flour that was over-bleached and turned to a sulphur color, was accumulated in your mill.

A. Between the end of the conveyer and the conveyer box, there was probably a two-inch space in there and it would accumulate in there and also in the top corners of the box. It would stick to the sides, somewhat.

A. C. Leflang, recalled, was examined further, and testified as follows:

### Direct Examination

By Mr. Butler:

Q. Mr. Leflang, what is the name of the agitator that you used to bleach this flour, and that you have been examined about, here?

A. I think it is the Mitchell agitator. It is the same one that has been designated by that name before the court.

Q. The same one that has been designated by that name, before the court? A. The same one. The horizontal machine.

Witness excused.

Denison, being recalled, testified further as follows:

### Direct Examination

By Mr. Butler:

Q. I intended to ask you this morning, but I overlooked it, about this accumulation of flour, that is bleached yellow, about the mill. What kind of an agitator did you have?

A. I had a Mitchell. Came with the Alsop. Every-

742 thing came from the Alsop people.

The whole outfit? Now describe to the jury where, in just such an agitator--this Mitchell-the same as Mr. Leflang referred to-this flour is liable to accumulate, and turn

sulphur colored by this bleaching?

- A. It accumulated, on the outside jacket. That is, on the inside of the outside galvanized iron jacket. There was about eighteen inches space between the beaters and the jacket, and between the beaters and the jacket, that would accumulate on there.
- Will this beaker fairly well represent the shape of the Mitchell agitator? A. Yes, sir.

And it is metallic galvanized iron?

A. Yes, sir, the outside case,

Q. And there are some beaters? A. Revolving.

Q. Set in the center and whirling around like fans?

A. Yes, sir.

And there is a space on the outer edge of the beaters, between them and the inner sides? A. Yes, sir.

Now, where was it the flour accumulated? Q.

A. The same as the glass would be, there.

Q. Just the same as a frosting on the inside of the glass?

A. Yes, sir.

What was the clear space there? How close to the inside of the agitator did the beaters come? A. About an inch.

About an inch? A. Something like that. Q.

Now, what did you observe with respect to the flour accumulating there, and becoming yellow?

A. It would become yellow about like sulphur.

Q. Now, the bottom of this thing is funnel shaped—the bottom of the agitator? A. No, it isn't funnel shaped.

Q. Well, how is it? Is it flat?

A. It lays horizontal and the outside spout was about an inch and a half or two inches from the tail end, as you call it, and of course, the flour would accumulate there, on the jacket. We would probably clean off a half a bushel or something of that kind.

Q. About a half a bushel?

A. Yes, sir. And then, on the end, there, too, there might be a pint or such a matter. Of course, I never measured it.

Q. About how often did you clean it off?

A. We cleaned it off twice before we got to fix it. I fixed it, then, so it couldn't accumulate there. I put a brush at intervals on these beaters, so it would sweep the jacket, and keep that perfectly clean.

Q. That is a contrivance you invented, to keep it sweeping?

A. Yes, sir.

Q. Now, what I am trying to get at, independent of that, is, how frequently would this yellow coat, or yellow accumulated flour, on the inside of that thing, accumulate?

A. Well, I don't know just how long it did take. It was there every time we cleaned it out. It probably ran that way

two months, or such a matter, and then I noticed it.

Q. Did you taste or smell of this flour, after it had turned yellow? A. No, sir, I did not taste it.

Q. Did you smell of it? A. Yes, sir.

Q. How did it smell? A. It had a peculiar smell.

Q. And with regard to the smell, give us some idea of that.

A. I was reminded a great deal of when you are in a tinsmith's shop, when they are soldering, using acids.

Q. When they are what? A. When they are soldering. Q. Was it a pleasant odor, or— A (interrupting) No, disagreeable.

Cross-Examination

By Mr. Helm:

Q. Mr. Denison, you say some people use the Mitchell agitator? A. Yes, sir.

Q. And that is round, is it? A. Yes, sir.

Q. And, instead of being vertical, it is in a horizontal position?
A. Yes, sir.
Q. Do you have it on an angle, or horizontal?

A. It is level.

Q. The flour goes in at one end of that? A. Yes, sir.

Q. And it is worked down, by these beaters, to the 744 other end? A. Yes, sir.

Q. And goes out into a conveyer below?

- A. Yes, sir. Doesn't go into any conveyer below. It drops into the elevator.
  - Q. You say this is made out of galvanized iron?

A. Yes, sir.

Q. And I believe you have described that so the jury will understand that. I will not ask you anything about that, but the flour accumulated on the sides of this agitator?

. Yes, sir.

Q. And at a point right below the opening where the flour went in?

A. Yes, There was about an inch and a half or two inches

space, there, where it pushed by.

Q. Now, flour will accumulate in angles, in different parts of the mill, will it not, where there is obstruction to its free passage? A. Oh, yes.

Q. And it will remain there, will it not, in some quanti-

ties, in different parts of your mill? A. Yes.

- Q. Will that flour remain pure and wholesome, whether it is bleached or unbleached? A. No, sir.
- Q. It is not flour that you would put upon the market, at all, is it?
  - A. Why, no. Of course, it does get in, occasionally.

Q. It does get in occasionally?

A. Yes, sir. That is unavoidable.

Q. And with the best care you can take, you will have it?

A. With the best care any one can take.

- Q. And yet it doesn't get into your commercial flour, does it?
- A. Yes, sir. Whenever you have enough jar, to jar that loose on the spout, it will go in. That is the way we discovered it.
- Q. How long had you been operating your bleacher before you discovered that?
  - A. A month or two. I couldn't say exactly as to that.
  - Q. How long did you use your bleacher? A. A year.

Q. And you had no trouble afterwards?

- A. No, sir, not with that. Of course, in the spouts below that, we did. Still continued.
  - Q. But you were not manufacturing for sale this yellow flour were you? A. Well, I guess not.

745 Q. This sulphur flour?

- A. No, sir, we didn't want to. That is why I put the broshes in there. I didn't want to take any chances.
- Q. You could not put it upon the market and fool anybody with it, if you wanted to, could you?

A. I don't know, if they would not notice it.

Q. If it was a yellow flour, they would notice it?

A. Why, people don't look at flour-

Q. You noticed it at the mill?

A. No, not any more than cleaning that out.
Q. You never found it in the flour, in the sacks?

A. No, sir.

Q. Never did? A. No, sir.

Q. So, you never sold, or put any of this yellow flour onto any good housewife? A. I don't know.

Q. You never heard of it?

A. No, sir. We never had any trouble.

Q. Never had any trouble of that kind? A. No, sir.

Q. So that the use of this bleacher wasn't destroying the reputation of your flour, on that account, was it?

A. No, sir, it didn't, at least.

Q. Did not at all? A. No, sir.

Mr. Helm: That is all.

# Redirect Examination

By Mr. Butler:

Q. You could not tell how long a particle of it might be enclosed, and then drop off, and go on its way to the market?

A. No, sir, I couldn't tell anything about that. That is why I put the brushes in. I didn't want to take any chances.

Q. And the quantities would be relatively small, in a sack of flour, of yellow flour? A. Yes, sir.

Q. You might get only a handful?

Mr. Helm: He didn't say that.

By Mr. Butler:

746 Q. Well, it might fall off, from time to time?
A. Yes, sir.

Q. Now, it was not for fear of fooling people, by selling them sulphur colored flour, that you stopped its use?

A. No. sir.

Q. Now, Judge Helm made quite a point that there was no danger of fooling them that way. But, suppose that flour was poisoned by this process of bleaching, and that, when it turned sulphur colored, it was poisoned by this [santhro prodeid] action, or something of that sort, would you have enough of it, in those places around there, to affect the quality of a loaf of bread, we will say, if you got it in the bread.

Mr. Helm: We object to that as incompetent, irrelevant and immaterial, for the reason this witness is not an expert.

The Court: Sustained.

Mr. Scarritt: There is no use talking about it, it is already in.

The Court: The objection is sustained. I don't know what you gentlemen are saying. You may talk me out of it.

Witness Excused.

F. H. Krite, called as a witness on behalf of the Government, being first duly sworn, was examined and testified as follows:

## **Direct Examination**

By Mr. Butler:

- Q. You may state your name and residence.
- A. F. H. Krite, St. Louis, Missouri. Q. Mr. Krite, what is your age?
- A. Well, I will be 72 in a couple of months.

Q. Are you a miller?

A. Well, I have been in the milling business for the last forty years; before the roller process went in I done some grinding, but not since.

Q. Are you connected with the milling business?

I am Secretary of the milling company.

Q. And do you spend your time about the mill?

A. I do.

Q. Where is your mill?

A. East St. Louis, Illinois, right opposite St. Louis.

- Q. And have you continued to be connected with the business, otherwise than as a practical milling man—a manager, or about the mill all the time?
- A. Well, I generally look after everything. If there is anything wrong, they generally call me.

Q. Now, what is the name of your company?

A. Hezel Milling Company.

Q. How about the capacity? A. 500. Q. Twenty four hours? A. Yes, sir.

Q. Did your mill ever bleach its flour? A. Yes, sir.

Q. What process? A. Alsop process.

Q. How long did it bleach by the Alsop process?

A. We started in the beginning of 1904 and kept on part of the time up to February 15th, 1909.

Q. For about five years? A. No.

Q. 1904? A. 1904 up to 1909, February 15th.

The Court: That is nearly five years.

The Witness: Nearly five years.

By Mr. Butler:

- Q. Between four and five? A. Between four and five.
- Q. You became familiar with the bleacher? A. I did.

Q. And did you observe whether or not there was any odor to it? A. Yes, sir, there was an odor about it.

Q. Can you describe it? A. Well, it is a gasy smell.

Q. How is that?

- A. It is a smell something like some kind of gas. I can't describe exactly the smell.
  - Q. How far was your gas generator from your agitator?

About 90 feet. A.

Q. About 90 feet away? A. Yes, sir.

Q. Did you have a tank, or some tanks, between the 748 gas maker and the flour shaker?

We started first without a tank.

Yes.

- A. But we had some trouble with it, and I called Mr. Mitchell over, and he, himself, did not seem to know what to do, so he concluded that a tank would be of assistance, so we put a tank there, a tank about six feet wide, and about three feet in diameter.
  - Q. Is that the Mr. Mitchell who is here in the court room?

Yes, sir. A.

The manager of the Alsop process? Q. Yes, sir, manager of the Alsop process. A.

When was it you tried to improve it by a tank? Q.

What was the question? A.

When did you put in this tank arrangement? Q.

- That was some time afterwards? I can't tell you the A. date.
  - Do you know how long the plant had been in, without it? Q.

A. I suppose it was nearly six or eight months.

Six or eight months? Q. Something in that neighborhood.

A. Now, do you know what kind of a pipe you had to carry the gas mixed with air from your gas maker to your flour agitator? A. Yes, sir.

What was it? A. Steam pipe.

Q. An ordinary steam pipe? A. Iron steam pipe. Q. Made of iron? What kind of tank was put in?

A. Galvanized iron.

Q. Do you know its thickness?

No, I don't know the exact number of the iron. It was A. pretty heavy.

Have you any of the iron pipe that was used to conduct this air, modified by the flaming arc, to the flour?

- A. Yes, sir; one of your inspectors was there at the mill and he carried the pipe away.
  - Q. And is the pipe here, now?
  - A. Yes, sir, I believe so.

(Iron pipe referred to produced and exhibited to the witness.)

- 749 (Exhibit referred to is here marked by the reporter as Exhibit No. 14.)
- Q. Can you tell whether the piece of pipe that is marked by a tag attached thereto, Exhibit 14, was one of the pipes which was used to conduct modified air to the flour?

A. This is the pipe.

Q. Now, can you tell the Court and jury how long that pipe is? First, whereabouts was that pipe—was it nearer to to gas maker or the flour shaker?

A. No, sir, it was right over the agitator.

Q. Well, that is the same thing?

A. No, sir. The shaker is the machine that goes that way (indicating).

The Court: Is that the agitator?

A. No, sir.

The Court: Where is the shaker, as distinguished from the agitator?

A. Well, we have no shaker. We have no shakers.

By Mr. Butler (referring to Exhibit 14).

Q. What are these holes? What are these holes on the pipe? There is a row of holes on the pipe. What are they?

A. On each of them we put a small pipe, and that led into the agitator, so that the flour would get more air.

Q. This pipe laid right on top of the agitator?

A. Yes, sir.

Q. And was it connected down, by a little pipe in each of these little holes, leading into the agitator?

A. It was over the top of the agitator, and the gas went right down into it.

Q. The holes are about six inches apart on it?

A. Yes, sir.

Q. And extend over a length of pipe about five feet long?

A. About eight feet, I think.

Q. A row of holes on it? A. Yes, sir.

Q. And the length of the whole pipe is about eight feet long? A. Yes, sir.

Q. Maybe a little longer?
A. Maybe a little longer.

750 Q. Now, were there screws on the end of this pipe?

A. There were.

Q. Both ends? A. No, sir.

Q. Which end?

Only on this end, there was a pipe connection. A.

On this end there was a pipe, the screws made in the Q. ordinary way?

No. sir, just a-A.

Q. (interrupting) I mean, threads?

Oh, it was threaded. A.

That is what I meant. And these little, small pipes Q. conducted the air or gas into the agitator-do they have screws on them?

No, only when they are connected. A.

That is what I mean. They were screwed in? A. Yes. Q.

Screwed on one end that went in? Q.

Yes, sir. A.

Now, you observe, there, a crack or slit in this pipe, and that extends from one hole to the nearest one, in each direction, making a distance of about a foot, isn't it?

Yes, sir. A.

How did that come in there? Q.

I don't know. It was perfect when it was put up. A. Q. And how long was that pipe in use, before it got into that shape?

A. About one year, in daytime. About one year in daytime? Q.

We didn't run at night, that year. A.

Now, was that the first year or the second year?

Second year. A.

Where was the pipe that was first in-the same kind Q. of pipe?

It was a little different. They corroded so bad, they

were thrown in the scrap pile.

How long were the pipes in, that were corroded so you threw them into the scrap pile? How long did they last?

A. They lasted about that length of time?

About a year? A. Yes, sir. Q.

How many pipes did you have at this place, here, by the agitator, during the four or five years you had the process?

Well, I can't say positively about that, because we did't A.

keep no account of that.

Q. Can you give us pretty near the number? 751

The average life of them would not be, if we ran night and day, more than six months.

The average life of a pipe like that?

Without eating holes in them somewhere, so we can't A. use them.

Now, have you any of the other iron fastenings that the modified air could get at?

Mr. Scarritt: Now, what was this pipe, here, to be used for? We object to this witness, or anybody, saying anything about this pipe, because there is nothing here to identify this pipe, or show how long it has been out of the machine. I thought you were going to tell us about it. We have been listening for that, and you have told us how many holes there are in it, and all that, but you have not told us where it came from.

By Mr. Butler:

Q. When did you turn this over to the inspector for the Government?

Mr. Scarritt: Just a moment. So far as the testimony goes, your Honor, I object to the pipe being marked as an exhibit, or introduced in evidence, because, as I understood the witness, it has been out of this machine, for possibly a year, if I understood rightly.

The Witness: Yes, sir.

Mr. Scarritt: Laying around in some scrap pile, somewhere.

The Witness: No, sir; it was standing up right in the mill.

Mr. Scarritt: In the mill?

The Witness: Yes.

Mr. Scarritt: Standing up in the mill, not being used for a year. Now, that kind of testimony ought not to be introduced before a jury, to show what effect anything had on an iron pipe standing up in a mill, or anywhere else, for a year, because it is too remote.

The Court: Well, I had a case quite closely akin to this, which was the case of some company against the Savoy Hotel Company in Des Moines, that I tried a little over a

for that circuit, in the last few months, in which it was claimed that certain action would bring about certain results with a pipe about the size of that. The Court of Appeals held it was proper. You will find that case, I suppose, in the Federal Reporter; I am not certain about that. It was in the advance sheets. The Court of Appeals for this circuit, within the last few months, held it was proper. The objection is overruled.

By Mr. Butler:

Q. Mr. Krite, after you took this pipe, Exhibit 14, out of place, out of use, where did you keep it until you turned it over to the inspector?

A. We just stood it up inside the mill.

Q. Where it was used?

A. Close to the agitator; never carried it downstairs, because it stood right straight up.

Q. And when was it, do you remember, that you turned it

over to the inspector?

A. It was sometime in the beginning of this year, when he came to visit the mill. He saw the pipe there, and wanted it.

Q. Now, have you any other irons that came in contact with

the air modified by the Alsop process? A. Yes, sir.

Q. Is that one that is in your hand?

A. Yes, sir, this is one of them.

(The iron referred to was here marked Exhibit No. 15).

Mr. Scarritt: We made the same objection to this; that has been out of use a year, I suppose, too?

The Witness: No, sir.

Mr. Scarritt: How long?

The Witness: Only since the inspector took it.

Mr. Scarritt: How long?

The Witness: Beginning of this year.

Mr. Scarritt: I object to that for the same reason, if your Honor please.

The Court: Same ruling.

Mr. Scarritt: Plaintiff excepts. 753

By Mr. Butler:

Q. How long was this exhibit of iron or metal in use in the mill? A. That iron valve was used from the beginning.

Q. And where was that used?

From the tank to the agitator. A.

From the tank to the agitator? Well, was it nearest to O. the tank?

A. Yes, only a small difference, of course, in that.

Q. Now, the iron valve, you say, was in use all of the time that the Apsop process was in use? A. Yes, sir.

Q. Now, is this valve-

Mr. Scarritt: (interrupting) How long was that?

Mr. Butler: I am going to come to that. About four years and a half.

Q. Now, there is screwed into this valve a piece of pipe about two inches long? A. Yes, sir.

Screwed in by means of threads? A. Yes, sir.

Q. How long was that piece, two inches long, in place in that valve?

A. Well, when we run steady, we had to renew them about every four to six months.

Q. And this particular piece was the last one?

A. Yes, sir.

Q. Now, after you quit bleaching, did you take this thing apart, or did it remain in place?

A. It remained in place until the inspectors came there and

looked at it.

Q. That is about the first of this present year?
 A. About the first part of the year, the first month.

Q. You quit in February, 1909? A. Yes, sir.

Q. And that was taken out of there twelve months after you quit bleaching? A. Yes, sir.

Q. And, in the meantime, it remained in the mill?

A. Yes, sir. We never changed the position of the agitator, or any part of the machinery. We just stopped it.

Q. Do you know what kind of metal this heavy piece is?

A. That is cast iron.

754 Q. And what kind of metal that is—the two inch pipe? A. Wrought iron.

Q. And there is some brass, I take it, up here?

A. Yes, sir.

Q. I don't know what part of the valve you call it; do you have a name for it?

A. Well, that is the upper part of the valve—the outside.

Q. The stem, or something like that? Now, on the other end of this valve, which is marked 15, there is another pipa screwed in. Do you observe that?

A. There is no pipe screwed in there.

Q. When that was in position, was there a pipe screwed in there? A. Yes, sir.

Q. Was there threads on that end?

A. Yes, sir. The threads in them valves, like other valves, extend in about half an inch, but, if I am not mistaken, there is only about two threads on that, left.

Q. Now, this valve would have to be opened, to let the

gas pass through? A. Yes, sir.

Q. It is now in the open position, isn't it?

A. Now, it is in the open position.

Q. Now, speaking of the valve at the place of its largest circumference, I would like to have you examine, by looking and feeling the present thickness of it, where I place my fingers, at the largest circumference, and tell us whether or not there is any change in its present thickness, as compared with what it was when it was put into use?

Mr. Helm: We object to that as incompetent, irrelevant and immaterial, the witness not having shown himself qualified.

By Mr. Butler:

A. Well, if you know.

Mr. Helm: He has not said he knows what it was when it was put in.

By Mr. Butler:

Q. If you know, tell us, Mr. Krite, and if you don't, just

sav 80.

- Well, there ain't much in this, except the rust, what this gas has eat away. There is not much on that one, excepting here, on the threads.
- Q. Now, there is another valve, marked 15. Was that 755 valve in use, along the modified air line, from the gas maker to the agitator? A. Yes, sir.

Q. Where was that one?

A. Let me see it, please. (Examining the exhibit.) That was on the tank.

Q. Which end?

A. Where the gas came out through the agitator.

- Q. I thought you said 15 was at the end next to the agitator. A. They are both there.
  - There are two of them, there, are there? A. Yes, sir. Q.

Two pipes? A. Yes, sir. Q.

Q. Running to different agitators? A. Three pipes.

Q. Each one running to a different agitator?

A. Yes, sir.

- Now, is there any hole, in the cast iron part of that Q. valve? A. There is.
  - Whereabouts is it? A. Right there (indicating). Q.

Q. And how about the thickness of that one?

Well, where that hole is, the gas has ate it away. A.

Q. How about the threads on the end, where it connected up with the pipe?

A. Well, in that one there is only one thread left.

Q. On both ends, or on one end?

No, on the other end there is two and part of three.

- Was there, originally more than two on one end, and one on the other?
- A. Well, that extended in about five-eighths of an inchthe threads—five-eighths, maybe three-quarters, by close measurement.
- Q. Exhibit 17 is called to the witness' attention. Is that a piece of pipe that was used in that air line from the gas generator to the agitator?

Yes, sir, that was one of the pipes.

Q. Whereabouts was that?

A. That is one of the valves, similiar to the other one. This is used the same as the other.

Q. That is, Exhibit 17 performed the same office as the pipe about two inches long, which is in Exhibit 15. It is flattened some. It is not round any more. How did that happen, do you know?

756 A. That happened by taking it out.

Q. Do you know how long that was in?

A. Well, I guess that may have been in from four to six months. That was about the length of time that we could keep them in.

The Court: I will say to the jury at this time that all exhibits which are admitted in evidence will be in the room where you deliberate upon your verdict, at the close of the case so if you do not inspect them now, later on you will. Of course I mean such exhibits as may be admitted by the Court in evidence.

By Mr. Butler:

- Q. Did you notice whether or not, when you took out these pipes that had been in use in this air line from the gas maker to the shaker, whether there was any accumulation inside of them?
  - A. A lot of rust in them.

Q. Now, describe the quantity and appearance of that.

A. Well, as I haven't taken down the whole line of the pipe, I can't exactly give you the quantity of rust there was in it, but what I took down, I suppose there was a pint of it.

Q. Did you observe whether or not the inspector for the

Government took any of the rust out?

A. Yes, sir, he took some out.

Q. That is Mr. Wharton? A. Mr. Wharton.

Q. The same gentleman who has helped attach these tags and so forth, here, while you have been testifying?

A. Yes, sir.

Q. How much? Did you observe?

A. No, sir, I didn't observe how much he took. He took the monkey wrench and unscrewed it, and took it with him.

Mr. Butler: We will introduce the exhibits, 14, 15, 16 and 17.

Mr. Scarritt: We make the same objection, your Honor.

The Court: Objection overruled.

Mr. Scarritt: Save an exception,

757 By Mr. Butler:

Q. Did you, yourself, make the arrangement to buy this Alsop process? A. I was present.

Mr. Helm: We object to that as immaterial.

By Mr. Butler:

Q. How is that? A. I was there.

Q. Did you ever inhale any of the odors from the pipe?

A. I did.

Whereabouts? Q.

At the mill. I had a hose connected with the pipe leading to the agitators, and as parties had said that it was healthy for anybody to inhale, that there was no injury, that it was only a little gas, I wanted to find out whether it was or not and that is how I came to try it. I inhaled about one swallow every morning for nearly three weeks. Then, my stomach got out of condition, and I quit it, for fear of having to quit eating.

Q. When was that?

That was shortly after we put it up; not immediately, but shortly afterward, when I had a chance to have a pipe attached to it.

Q. And was that from the same line which conducted the gaseous medium into the flour, for bleaching it?

Yes, sir, same line.

Did you observe what effect the treatment of the flour by this stuff had? A. Oh, yes.

What? Q.

A. It gave it a whiter color. That's the reason we put it in.

Q. How many kinds of flour did you make there?

Make almost anything a man wants. A.

Q. Well, before you commenced bleaching, did you have any standard for patent flour?

Yes, sir, we had a standard for patent. Our best patent was the "U. S. Patent." By that name it was sold.

And what percentage was it, before bleaching? Q.

Before bleaching it was 55 per cent. A.

And did you continue to sell a patent under that brand Q. after bleaching? A. I did.

What percentage? A. 75 to 80 per cent. 758

Q. Did you bleach any of your flour, except the pat-I didn't bleach all of that, only for a little while. ent?

Well, I mean, at any time did you ever bleach any of your grades lower than the patent?

Yes, our agitator was fixed so we could bleach any grade.

Q. And did you, sometimes? A. I did.

Q. What did you call that which was left after you took out the patent? A. It would be extra fancy grade.

Q. Extra fancy patent, or just extra fancy?

Extra fancy, but I sold that same flour to other parties, and they sent the brand there to the mill, and they branded it "Patent". There is no law to prevent you. The Government has not established any grade.

Q. And no state has, either? A. No.

- Q. Now, what percentage was this extra fancy that you bleached? A. What we bleached, extra fancy?
  - Q. Yes. A. About 25 per cent. Q. 25 per cent? A. Yes, sir.
  - Q. That was after about 75 per cent was taken off?

A. Yes, sir.

- Q. Now, as to the color of the 25 per cent after it was bleached, how would it compare with the patent, before it was bleached?
  - A. Well, it would not compare equal with that. Q. Would it be as white, or not quuite so white?

A. Not quite so white.

- Q. Before bleaching, was there more difference in color, than there was after bleaching?
- A. Yes, sir, that is, if you class it against bleached and unbleached.
- Q. That is what I meant by my question. Now, as to the effect upon flour—the color of flour, aging it after it has been milled. Does that have any effect upon the color?

A. On which?

Q. On any flour? A. Yes, sir.

Q. Not bleached, I mean. A. Not bleached?

Q. Yes. A. Unbleached flour will age.

Q. And does that affect the color of the flour?

A. Yes, sir.

759 Q. Does it affect the color of the flour?

A. Well, it makes it drier.

Q. And what effect does it have upon the color of the flour? A. It brightens it a little more.

Q. It whitens it some?

A. Yes, sir; the fresh ground flour is not quite as white as

if it is three or four weeks old.

Q. Now, with the use of this Alsop bleacher, is there any difference resulting from different degrees or amounts of bleaching? A. Yes, sir.

Q. Explain that.

A. Well I don't know whether I can just explain that, to percentages, or not.

Q. No, I don't mean to percentages, but the general color.
 A. If I see the flour and I thought it was too much bleached,
 I told them to cut some of it off—shut a valve off.

Q. Now, what I am trying to get at is this, the more the treatment, the more the bleaching? A. How is that?

Q. If either treated longer with the Alsop process, or more concentrated gas, does it bleach more than if it is just lightly touched? A. Yes, sir.

And did you, yourself, observe that from time to time? Q.

Yes, sir. A.

And gave directions about it? A. Yes, sir. Q.

Did you, yourself, observe any overbleached flour about Q. your spout?

No, not in the spout, but I did in the whole of a cer-

tain run, where I did get overbleached flour.

In the whole of a certain run? A. On a day, yes. Q.

Now, what was that? What was the effect of the over-Q. bleaching on it?

Well it had too much on it and the flour appeared to be A.

dead.

Was it white still, or had it turned yellow? Q.

It was white, but a sickly white. A.

Was that a whole day's run? A. Yes, sir. Q.

What was that—a patent flour? Q.

The patent, as well as the other.

You bleached both? A. Yes, sir. Q. 760

Do you remember what percentages you were running, when you got that result. on the whole day's run?

Well, we were running then about 80 and 20. A.

80 and 20? A. Yes, sir. Q.

Now, what was the color of that-the clear? That, of Q. course, before bleaching would be darker than the 80?

Oh, yes, it would be darker than the 80. A. You could see a good deal of difference? O.

Yes, sir. A.

Now, after you bleached that, in the case of heavy Q. bleaching, that day, what was its color?

It was a sickly white color. A.

Sickly white? Now, what was the color of the patent? Q.

Well, that is the same way. A.

They were both of the same color, were they? Q.

A. Both of the same color.

So that this process, there, could take the 80 per cent Q. patent and the 20 per cent, when there is a good deal of difference in color before bleaching, and bring them to the same color? A. Yes, sir.

Q. Did you, yourself, ever have any means of telling whether or not the flour, after it was bleached, improved with

aging? A. After it was bleached?

A. Not that I know of. Q. Yes. Did you, yourself, ever have any means of knowing whether or not it affected it or made any difference in the quality of the dough, or the gluten, or the bread?

Why, yes. If you have a flour which is even moderately bleached, and break up the bread immediately after it is baked, you can smell the gas.

Q. That is, when you say immediately after it is baked, do you mean while it is still hot? A. Yes, sir.

Q. Have you yourself done that, or seen it done?

A. The first flour I took home, my wife baked out of it, and she said, "Don't bring any more of that."

Mr. Helm: Now, we object to that.

761 By Mr. Butler:

Q. You brought home some flour, and your wife baked it, now, you need not say what she said. A. All right.

Q. But, did you talk it over? A. Yes, sir.

Mr. Scarritt: Now, we object to that.

The Court: We will take a recess, gentlemen.

(Recess taken for five minutes.)

(The further examination of Witness Krite was then resumed as follows:)

By Mr. Butler:

Q. Now, what was that, a bread or a biscuit, made from this bleached flour?

A. That was both biscuits and bread.

Q. Now, this was the same kind of flour that you were used to, before bleaching?

A. It was our best patent flour, after bleaching.

Q. Did you know what kind of bread and biscuits it had made before bleaching? A. Yes, sir.

Q. How did you know that? A. By having baked it over. Q. Now, did you open it while it was hot? A. Yes, sir.

Q. Smell of it? A. Yes, sir.

Q. How did it smell?

A. It had this acid smell, the same as the bleacher.

Q. And was that in both the bread and biscuits?

A. Yes, sir.

Q. Was there any difference in strength of smell?

A. No, sir, it was all the same package of flour.Q. Did you afterward ever try that again, at other times?

A. Yes, sir. Results were the same.

Q. Did you ever try your extra fancy that way, too, when it was bleached? A. Yes, sir.

Q. How about that?

A. The same smell, because we bleached it at that time.

Q. Yes, I know. That is the way I understood you. 762 Now, did you taste it, too? A. Yes, sir.

Q. Did you notice any difference in the taste between the bleached and the unbleached, of the same kind?

A. Yes, sir, there is a difference.

Q. Can you describe it?

A. Well, I will, as near as I can. The bleached flour,—strongly bleached flour,—did not seem to have any taste.

Q. Strongly bleached flour?

A. Yes, sir. That is, except you might tell slightly of the acid, but it didn't have the same flavor of the wheat, as the former flour had—the unbleached flour was much sweeter.

Q. Now, about the color of the bread made from the

bleached flour as compared with the unbleached?

- A. The color of the bread did not show so much, as it did in the flavor.
  - Q. What do you mean by that? Make that a little plainer.

A. That is, it don't get so much of a deadly white color as I expected, as the flour showed.

Q. That is, the bread did not have? A. The bread.

Q. Now, after the bread cooled off and became cold, did you notice any difference, then, in the odor?

A. Well, that bread dried out faster than the unbleached.

Q. Dried out faster? A. Dried out faster.

Q. Did you, yourself, have any observation about the kind of dough that the bleached flour would produce, as compared with the same flour not bleached?

A. I frequently doughed up the flour, and our regular, best patent flour, and can dough up and make it as tough as a piece of tissue paper, and tear it out, or widen it, just as I want to, but I couldn't do the same on the patent—or the bleached.

Q. Why? A. Because it broke off.

Q. Well, are you now speaking of the same kind of flour, the only difference being bleached and unbleached?

A. Same kind.

Q. Did you have more than one observation of that kind?

A. Yes, I had them frequently, because I wanted to try it, and to see if I couldn't make them both work alike, and I could not do it.

Q. What did you use there,—the bleached patent and the

unbleached patent?

A. The bleached patent and the unbleached patent.

Q. Did you ever try it on the clear, bleached and unbleached? A. No, sir, I did not.

Q. Now, as to the color. Did you ever wash out the gluten?

A. Well, I don't do anything with that.
Q. You just took it and doughed it up?

A. I took it and doughed it up.

Q. That was at the mill, was it?

A. It was at the mill.

Q. Now, was that done at different times? A. It was.

Q. Was it done regularly, I mean, or occasionally, as a part of your mill observations?

A. That is part of the milling proposition. If I can't see

nothing, I try to feel it.

Q. Now, as to the amount of difference in the dough when the flours are exactly the same, except one is bleached and the other is not bleached, and the Alsop process used, can you tell us something about that? Give us some idea of the amount of difference; was it slight or otherwise?

A. Well, I would have to give you a percentage.

Q. Well, I don't know any way. If you can make it clear-

A. This is about the best way, I think, I can make it clear. We put it in the bleacher, on account of competition in business. Other mills what had bleachers, they turned out a whiter flour, and came into competition with us in price, so our patent was 55 per cent, as the general run, but, after we bleached it, and got into the hang of bleaching it right, we could use 80 per cent, and of course we could compete with them in price.

Q. Well, under the same branding as you did before?

A. Yes, sir, same brands.

Mr. Butler: I think that is all.

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## Cross-Examination

Br. Mr. Helm:

Q. Mr. Krite, I think you say you are 72 years old?

A. I will be 72 in a few months.

Q. And how long since you ceased to have charge and be the practical miller of a mill?

A. Oh, that is a good many years ago.

Q. Before the introduction of the roller system of milling?

A. About that time.

Q. Your milling experience, during the time when you were a miller, manufacturing flour, dates back to the use of the old process, in use prior to the roller mill?

A. Yes. I don't think that has anything to do with this

case.

Q. Perhaps not.

A. That is about 30 years ago—25 or 30 years. I had a mill with—

Q. (interrupting) That system of milling is not in use today, very generally, is it?

A. No, sir, but I made just as good a flour then, as now. Q. Yes, I expect so. And you have had no real experience as a miller, making the flour—I mean the practical miller?

A. I have-

Q. (interrupting) Under present system?

A. I have had just as much experience as him, seeing the flour every day, and being right there on the spot every day.

Q. But you haven't been the miller?

A. No, sir. I don't think that matters any.

Q. Well, perhaps it doesn't. But that is not the question we are considering here. You may answer my questions, please.

A. Well I will try to answer your questions when I can

get them.

Q. That is all I will ask of you.

A. That's right. I will try to answer them.

Q. If you will do so-

A. (interrupting) Sure, I will.

Q. (continuing)—without delivering these lectures as to whether they are material or not.

A. Don't tie me down to any secrecy.

Q. How is that?

A. Don't tie me down to any secrecy.

765 Q. I didn't know there was any secret in this.

A. Yes, there was.

Q. There was? A. Yes, sir.

Q. You knew the secret?

A. Yes, when the mills started bleaching, they were very careful not to tell their neighbors a word.

Q. You kept it a secret? A. Of course I did.

Q. You kept it a secret?

A. I didn't keep it no particular secret? Anybody coming to my mill, they couldn't see it.

Q. Now, they could see it in any mill where it was installed, could they not?

A. Not that I know of.

Q. Was yours different than the others?

A. Not that I know of, there was no difference.

Q. But they could see it in your mill?

A. Yes, sir.

Q. They could see it in any of the other mills, couldn't they?

A. Well, I have been in other mills, and I didn't see it.

Q. Well, it is a fact that all mills didn't have it.

A. They did have it.

Q. All mills had it?

A. No, those that had it at that time.

Q. You'didn't see them?

A. No. I couldn't see where it was, and I did not want to ask them.

Q. Have you been connected with the same mill during these forty years?

Yes, for a little over forty years. That is, it is not

the same mill, not the same spot.

Q. But it is the same manufacturing company, or, is it a

company? A. The same company. Our first mill we run there twenty nine years and a half, and that was destroyed by the cyclone in '96.

You reconstructed a new mill? Q.

No, sir. We bought another place and built it at once. A. Q. But it is the same company and the same capital?

Same company. It is a stock company, under the laws A. of the State of Illinois.

Q. And you have how large a mill? What is its ca-766 pacity? A. About 500 barrels.

Is that as large as it ever was? A. Yes, sir. Q.

Q. Now, you installed this bleaching apparatus and used it about five years?

Well, you can easily figure that up. We started it in

the first part of 1904.

Well, I am not asking you dates, but putting it in years. Q.

A. Pretty near that, but didn't use it at all times.

Didn't use it all the time? Q.

No, sir, because during these five years, we have had very severe times down there, in the milling business and most of the time the mill only run half the time.

When you were running your mill, you used it?

A. Not always.

Q. During the time you were using it?

A. During the time, sometimes.

Q. You shut it off sometimes, and [-] not use it?

A. Yes, once or twice.

And you do as you said-make any kind of flour that a man wanted? That has been your policy?

Yes, we can do it. A.

Yes, you can do it? You can make it bleached flour or unbleached flour? A. Or unbleached flour.

And you can make a high patent or you can make a short patent? A. Yes, sir.

And you do that, do you, to cater to the trade? Q.

Yes, sir. A.

Q. Now, you have had all this time certain brands, have you not, that you have used as your individual brands[or] Yes, sir. flour? A.

Q. What are the names of your brands?

A. One is marked "White Knight." Another is "U. S. Standard."

Q. The first one please? A. "White knight."

The next one? Q.

- The next one is "U. S. Standard," "Missouri Bells", "Hemico," and a dozen others. 767
  - Q. How long have you used the "U. S. Standard"?

A. About thirty years.

Q. About thirty years? A. Yes, sir.

Q. Did that name mean anything further than simply to identify your flour? Was there any such thing as a "U. S. Standard"? A. Name of the flour.

That was the name of the flour? A. Yes, sir.

Q. Did you put that on them with any idea that you were making flour that corresponded with any standard that the Government had fixed, and that was a "U. S. Standard"?

I don't know of any.

You didn't know of any? A. No, sir. Q.

Q. What did "U. S." mean?

- Well, it originally meant United States. A. United States Standard? A. Yes, sir. Q.
- Now, you have used that brand for about thirty years? Q.

A. Yes, sir.

Use it yet? A. Yes, sir. Q.

And you used it before you commenced bleaching? Q.

Yes, sir. A.

Is that your highest grade of flour? A. Yes, sir. Q.

It is? A. That is the highest grade, of that standard. Q.

Well, it is a patent flour, isn't it? Q. Yes, but we can make a better one. A.

You can make a better one? A. Yes, sir. Q.

But it has been maintained as your standard all that

time, hasn't it? A. Yes, sir, as near as we can get it.

As near as you can get it, you maintain the standard. Isn't it a fact that all millers endeavor to maintain the standard of their brands? A. Well, they do, I guess.

Q. In fact, you build up a trade on a brand, do you not?

Yes, sir. A.

- Your product goes into the market, and is sold on that Q. brand, isn't it? A. Yes, sir.
- Q. "U. S." brand, perhaps, is well known in St. Louis, 768 isn't it? A. Oh, yes.

"U. S. Standard"? A. Yes, sir. Q.

You have sold thousands of barrels of it? Q.

A. Yes, sir.

Hundreds of thousands of barrels, perhaps? Q.

A. Yes, sir.

- The housewives of that city understand the "U. S. Q. Standard" brand?
  - Why, not all of them; I couldn't say that.

Q. Not all of them, but your customers do?

A. Some of them, and I guess some of them don't.

Q. Yes, but that is worth money to you—that brand you have built up?

A. Why, of course, that brand is of some value.

Q. It is your particular grade of flour? A. Yes, sir.

Q. You have endeavored to maintain that all the time the

same, haven't you? A. As near as we can.

Q. As near as you can? Now, you had used that brand for a great many years before you knew anything about bleaching, didn't you? A. Yes, sir.

Q. Used it while you were bleaching? A. Yes, sir.

Q. Now, you endeavored to maintain that standard all the time, didn't you? A. Yes, sir.

Q. What per cent did you say you were making before?

A. 55 per cent.

Q. 55 per cent? And that would make a certain grade of flour, would it not? A. Yes, sir.

Q. And afterwards you say you made what? A. 80.

Q. Did you maintain your standard?

A. As near as we could.

Q. As near as you could; it was just as good afterwards as before?

A. I had to put 80 per cent in, in order to compete with my neighbor.

Q. But you maintained your standard, did you?

A. No, sir, I don't believe, myself, I maintained my standard, but it looks I did.

769 Q. You what? A. It looks, I did. Q. It looks you did? A. Yes, sir.

Q. Well, it was just as satisfactory to the market, wasn't it? A. No, sir.

Q. Then, you didn't maintain your standard?

A. Well, so far as looking at the flour; that is what I have got to see to, that it is equal to anybody else's flour, or of the same grade.

Q. Well, is there anything else to be considered in de-

termining the value of the flour, than its looks?

A. Not for the present.

Q. Not for the present? A. No, sir.

Q. That determines entirely the question of the value of the flour? A. Its looks, and its baking qualities.

Q. Do you mean by that that the people—the public who used flour, want a white flour?

A. They want a white flour.

Q. They want a white flour, and that is the thing they look to? A. Yes.

Q. And the other things don't count so much.

Of course they count. A.

Of course they count? A. Yes. Q.

You could tell the difference between this flour, bleached Q. and unbleached, could you?

A. Yes, I could tell the difference, when it is-

(Interrupting) Any ordinary flour merchant can tell the difference, can't they? A. No, sir.

Q. What? A. Lots of them can't.

Q. You always marked it "Patent" flour? A. Yes, sir. Q. Do you have the word "Patent" on all of your flour?

A. No, sir.

Q. You had a "Fancy Patent", did you-"Extra Fancy"? What was that brand? A. "Extra Fancy"?

Yes. A. Oh, yes; I have lots of them.

Well, you spoke in answer to a question of Mr. Butler, (). about a brand that you called "Extra Fancy".

A. "Extra Fancy."

And that was a patent flour? A. No, sir. 770

Q. I believe you said you put it in sacks that had the

word "Patent" on it?

No, I told you-told Mr. Butler, that we had sold it to other parties, and they came and put "Patent" labels on it not me.

Q. In your mill, did they? A. Yes, sir.

Q. In fact, didn't you pack it in their sacks?

A. Yes, I guess I did.

Q. And had the word "Patent" on it? A. Yes.

And it went out of your mill, marked as an "extra fancy patent flour"? A. Yes, sir.

Q. Right out of your mill? A. Yes, sir.

Q. And it only contained about 20 to 25 per cent of the flour, after 75 per cent of the best or patent flour had been taken out of it? A. That is right.

Q. It was, in fact, a low grade flour, wasn't it?

A. No, it was not a low grade.

Q. Well, it wasn't a high grade, was it?

A. It was pretty nice flour.

Pretty nice flour? A. Made out of a very fine wheat. Q.

Are you acquainted with the flour that is in controversy in this suit, of the Lexington Mill & Elevator Company?

No, sir, I don't know anything about that. A.

Which is marked, as I remember it, "Fancy Patent"? Q.

The Court: He says he knows nothing about it.

The Witness: I know nothing about it.

By Mr. Helm: Q. This is marked "Extra Fancy." Yours was marked "Extra Fancy Patent"? A. "Extra Fancy", yes.

Mr. Butler: He said it went out of his mill marked that way. That was after he sold it.

The Witness: Oh, we didn't brand it that way, ourselves.

By Mr. Helm:

771 Q. Well, put in your sacks?

A. No, sir, I told you it was not in our sacks. If a merchant buys anything from me, he can put on it what he pleases, it is none of my business. It is his property.

Q. Does it make any difference to you whether a man comes into your mill, and stamps an inferior flour "Patent Flour" or "Extra Fancy Patent Flour", and puts it on the trade with your name on it?

A. Not in the least, our name is not on it.

Q. Don't you put your name on any of your flours?

A. On the flour what we sell, ourselves.

Mr. Butler: This "Extra Fancy Patent" is what he refers to.

A. If you come to the mill and buy a hundred barrels "Extra Fancy" and you put "Straight Patent", I can't prevent you.

Mr. Helm: Not in your own mill?

A. No, sir.

Q. Well, is that what he put on? That wasn't on when you made it? A. Sir?

Q. He just puts that word "straight patent"-

A. Oh, no. There is various brands. I can't remember them, but after he buys it, it is his property, and not mine.

Q. Are you a practical baker? A. No, sir.

Q. Such tests as you have made, of baking, have been such that you made at home, or that your wife made?

A. Such tests that I have made and have been making for

the last 40 years or more.

Q. Well, you made flour before you knew anything about a bleacher? A. I guess I didn't.

Q. Didn't make these tests?

A. No, sir. Before I knew anything about a mixer?

[A.] A bleacher.

A. Oh, a bleacher. Yes, I made them before that.

Q. Now, what is the purpose you have in making these tests, to determine the quality of the wheat you are using—both the quality of the wheat and the quality of the flour—

772 the quality of the flour that will be produced from certain grades of wheat? A. No. sir.

O. Well, all wheats are not alike, are they? A. No, sir.

O. And wheat from the same section of the country and from the same variety of wheat, is not the same every year, is it? A. No, sir.

Q. Now, you make tests after each crop, don't you?

Make tests nearly every day.

Q. Nearly every day?

A. If I grind hard wheat, I make the same test out of it, or if I grind spring wheat, I make the same test out of it.

Q. But you are testing it, practically, to test the quality of the flour you are getting out of the wheat you are using?

That is what I make it for.

And that varies, almost, as you say, from day to day, with your experience?

No, it don't from day to day.

Q. I understood you to say you made tests almost every day.

Yes, that's right, but haven't I got a right to? .1.

Q. Don't you find it the same every day? Sometimes I do, and sometimes I don't. .1. It varies quite frequently, don't it? ().

A. No, sir, it don't.

Tests all the same? ().

A. Pretty near on a line, when I make the same grade of flour, out of the same grade of wheat.

But there is a difference in the character or color of flour produced from wheat grown year after year? A. Yes.

And a difference in the crops? A. Yes, sir. And you have a difference in the grade of wheat?

.1. Yes, sir.

There is a difference in the condition of the wheat, isn't there?

A. Yes, I have to put it, though, in good condition before

I grind it.

But all those things will show this, and can be detected by you in the tests that you make, can they, as to the grade of flour you are getting from them?

Well, if I find I am not getting the right results, what I expect, why, then I branch off to some other wheat. Q. You say that you experimented with gas in this

11.3 machine, breathed it? A. Yes, sir, I did.

Was that soon after you put it in? 0.

About a couple of months after I put it in. 1. And you did that for three or four weeks? Q.

No, I didn't say no three or four weeks. Α.

How long did you say? ().

A short three weeks, I had plenty of it. Α.

Short of three weeks? Well, what time did you do it? O.

What time I done it? Λ.

Q. Did you use it right away? How long did you conduct that experiment? A. Very near three weeks.

Q. I understood that is what you said before—three weeks.

A. Well, I didn't do it every day, during the three weeks, but three weeks was the experiment.

Q. That was soon after you bought this machine from Mr. Mitchell? A. Yes, sir.

Q. And put it in your mill? A. No, I bought it from Alsop.

Q. And the gas made you sick? A. Yes, sir.

Q. Affected your digestion? A. Yes, sir.

Q. Did you go to bed? A. No, sir, I did not. Q. Did you call a doctor? A. No, I did not.

Q. You knew the gas made you sick?

A. Sickness has not carried me to bed, yet.

Q. No? I hope it won't for many years yet.

A. It never did.

Q. You didn't even have to have a doctor? A. No, sir.

Q. But you diagnosed your own case, and knew your trouble was due to this gas?

A. I went to a doctor and told him to give me something for my stomach, and he gave me some pepsin, or something like that—whatever you call it.

Q. And you quit breathing the gas?

A. I quit breathing the gas, you bet I did.

Q. But you didn't quit going on and manufacturing and bleaching your flour? A. No, sir.

Q. You were willing the other people should take it and breathe it and get the same condition that you got?

774 A. I had to bleach the flour, just the same as anybody else.

Q. Nothwithstanding it poisons every one of your customers. A. I don't know it poisons every one of them.

Q. You pretend to do business as an honest man?

A. Do you think I could shut up my business, and leave it

stand there, and let others do it?

Q. Of course not, but wouldn't you, for such consideration as the life of the people? Would you allow that to prevent you from shutting up your mill?

A. Is there any article—there was no other article—every

article of food, nearly, is adulterated in this country.

Q. That is your opinion?

A. Flour, according to my opinion, was the only article left that was not left adulterated, until this bleaching system come.

O. And you helped to adulterate that, in your opinion?

A. Why, of course I did.

Q. You went at that? A. Yes, sir.

Q. And you had tried it, and found it had made yourself sick? A. Yes, sir.

Q. And didn't care if it made the other people sick?

A. That is their lookout.

Q. That is their lookout? But you are not doing it now?

A. No, sir.

- Q. You have reformed? A. No, sir, I did not reform.
- Q. Can't make as much money out of it, perhaps?
   A. No, I simply obeyed the order of the Government.

Q. Never mind. You can answer my questions.

A. All right.

Q. Now, you say you had a pipe, which you brought in here?

A. Yes, sir.

- Q. When were these pipes taken out of your mill?

  A. They were taken out the beginning of this year.
- A. They were taken out the beginning of this year.

  Q. Do you know where they have been since that time?

A. No, sir, I don't know where they have been.

- Q. Who took them out? A. Mr. Wharton took them out. Mr. Helm: Is the gentleman here?
- 775 The Court: Will you please stand up, Mr. Wharton? (To the witness) Is that the gentleman?

The Witness: That is the gentleman.

By Mr. Helm:

Q. He took them out, some time in January?

A. Yes, sir.

Q. Took them away with him? A. Yes, sir.

Q. You don't know where they have been since that time?

A. No, sir.

- Q. You have never seen them from that time till you saw them here in the courtroom?
  - A. I saw them in the anteroom here this morning.

Q. Well, here in the building somewhere?

A. Yes, sir.

Q. And that was true of these pipe and these valves, and all of these iron exhibits, that you have handled here?

A. Yes, sir.

Q. They were all taken away at the same time?

A. Yes, sir.

Q. You don't know what he has done with them since that time? A. No, sir.

Q. Nor where he has had them? A. No, sir.

Q. Nor how they have been treated? A. No, sir. Q. Now, you pointed out here, to Mr. Butler; in handling this pipe, some round holes in here?

A. Yes, sir, that's right.

Q. Do you know how those holes were made in that pipe?

A. Yes; we bored them in there.

Q. You bored them in there? A. Yes, sir.Q. And the gas didn't eat them? A. No, sir.

Q. Then, you didn't want the jury to believe that the gas ate these holes in there?

A. No, I explained to the jury before, we bored those holes in there, and tapped them.

Q. Just answer my questions, and we will get along. The gas didn't do that? A. Didn't make those holes.

Q. They were bored in there?

A. Yes, sir, they were bored in there.

Q. Now, he called your attention to a place where this pipe is cracked here? A. Yes, sir.

776 Q. Do you know what did that?

A. I suppose the gas done it.
Q. Do you know what did it?

A. The gas, according to the best of my knowledge.

Q. Is this gas like a steam pipe, with pressure in it that will burst the pipe? A. Yes, there is pressure in it.

Q. There is pressure in it? A. Yes, sir.

Q. In this gas? A. Yes, sir.

Q. With steam pressure?

A. No, sir, not steam pressure. It is just the pressure of the gas.

Q. And do you say that this crack here was the result of pressure of this gas? Λ. According to my belief.

Q. That is what did it? A. Yes, sir.

Q. It would take a pretty heavy pressure, wouldn't it, to

crack that pipe?

A. If you have a pump there, pumping up and down, pumping this gas into it, right straight along, and you have got the thing shut off.

Q. It would cause this to break?

 Something would have to break; I don't care whether that broke or something else.

Q. Do you know when that crack was first known to be in the pipe?

A. As soon as we knew it, we took it out.

Q. As soon as you knew it, you took it out?
 A. Yes, sir, because the gas excaped in the mill.

Q. Well, how long had it been excaping that way, do you

know? A. A few days, perhaps.

Q. And you don't know what did it, only you found it there?

A. Yes, sir, found it there that way.

Q. That is all? A. That is all.

Q. Now, you spoke about these valves—that there were no threads in them. Isn't it true that there are threads in them, just as it was when it was first made?

A. (examining the exhibit) Now, you see there is only one full thread, left. The balance is eat away. You can measure it yourself, if you have got a rule here,—I have not—and find how much it has eat away.

777 Q. Now, these threads—you say there is only one of

them left? A. Yes, sir.

Q. They originally extended into this?
 A. Yes, about five-eighths of an inch.

Q. About five-eighths of an inch? Now you say there are no other threads there? A. No; you can see it there.

Q. The threads are there.A. No, there is nothing there.

Q. Well, I think the jury has examined this.

A. Well, they can examine it.

Mr. Smith: If they have not, they will have a chance.

By Mr. Helm:
Q. And you have looked at the other end? A. Yes, sir.

Q. From your judgment and from your inspection, would you say there are no threads there except the first one?

A. That is all.

Mr. Helm: Well, I don't care to have the jury handle it the second time. I think they have already handled it.

Q. Now, do you use any steam power about that mill? A. Why, of course we use steam power to run the mill.

Q. Do you use steam to cleanse and prepare your wheat for grinding? A. Yes, we do.

Q. You do? You use a great deal of steam at that mill,

do you not? A. Not any more than any other.

Q. Well, all mills that use the modern process, steam and

get their wheat to a proper temperature, do they not?

A. There is very little steam used in that.

Q. Well, there is some steam? A. Very little.

Q. You use it not only for power, but there are other things you use it for?

A. We use it to temper the wheat, to some extent.

Q. Now, you understand that pipes of that kind will corrode, when subjected to moisture, anywhere, will they not?

A. Well,—shall I answer that question?

Q. If you know.

A. Well, I must answer from experience.

Q. Yes.

A. I have had valves like this in use, in water, for thirty years, and the threads were good.

Q. Yes? Well, you have seen others that were thrown

to the scrap pile long before that, haven't you?

A. Not in my mill.

Q. Not in your mill? A. No, sir.

Q. Have you had any pipes in your boiler that you have had to take out? A. That is a different thing.

Q. Have you? A. The threads are always good on them.

- Q. That don't make any difference. Have you had to take them out, and throw them away? A. Yes, sir.
  - Q. You have had to take some of your water pipes out?

A. No, sir.

Q. Do you use any? A. Yes, sir.

- Q. Have you known about a refrigerator plant—an ice plant? A. No, sir.
  - Q. Don't know how about that?

    A. Don't know anything about it.

Q. You don't know that they have to take their pipes out, every few months, with simply water?

A. I knew that, but from my own experience, I don't know

it.

- Q. Not from having conducted an ice plant, or anything of that kind?
  - A. No, sir, I never conducted an ice plant.
    Q. But you do know it, as a fact, though?

A. What I answer would have to be what I know, and I

don't know that, because I didn't experiment with it.

Q. Not personally, under your observation? Now, you spoke about getting onto the knack of handling this bleacher. That, like all other processes, requires some experience, does it not, to know just how to handle it? A. It does.

Q. And the conditions you found, such as the making of bread, and having overbleached flour, and so forth, occurred in the very early period of your use of that, did they not?

A. No. they occurred later, too.

Q. In '82? A. Later, too.

Q. I believe you mentioned something about having a lot of it returned. A. I did.

779 Q. Of overbleached flour? A. Yes.

Q. When was that?

A. That was shortly after we put the bleacher in.

Q. That was shortly after? A. Yes, sir.

Q. And the baking and the talk with your wife, was shortly after you put the bleacher in? A. Yes, sir,

Q. Now, what other difficulties did you have?

A. Oh, none, particularly.

Q. None, particularly. Now, after you got onto the knack

of it, you said-

A. (interrupting) When parties came and wanted to buy flour, if they asked me if the flour was bleached, I would simply tell them it was bleached.

Q. Why, you would not misrepresent it, of course?

A. I never told anybody yet, when I sold them flour-

Q. (interrupting) You never meant to convey any wrong impression, in using the brand, "U. S. Standard", did you?

A. No, I didn't either.

Q. And yet, you know there was no such thing?

A. There wasn't any such thing; there was never such [—] thing. Never any such word as "patent" before—

Q. (interrupting) What did you do with this day's run, that you had this bad flour? A. Sold it.

O. You sold it? A. Yes.

Q. Did you sell it for flour? A. Yes, sir. Q. Did it come back on you? A. No, sir.

Q. Didn't find it out? A. Yes, they found it out.

Q. Did they find it out before you sold it? A. Yes, sir. Q. You were not able to put that in your regular trade, then, were you? A. No, I didn't.

Q. You didn't?

- A. Except some of it that went in before I was aware of it.
- Q. You found a special customer and told him of the injury to that flour, did you?

780 A. I sold the flour.

Q. Did you tell him what it was?

A. No, sir.

Q. Did you make him a special price on it?

A. No, sir.

Q. But I understood your first answer was that you did not put it in the regular trade.

A. Didn't put it under our brand.

Q. How?

A. Didn't put it under our regular brand.

Q. You didn't put it under your regular brand?

A. No, because I found a chance to sell it.

Q. How did you brand it? A. I don't know.

Q. You don't know? Well, you discovered it? You knew there was something that had happened, that had made that flour overbleached that day, didn't you? A. Yes, sir.

Q. And that occurred just once during your experience,

that you had such a run?

A. Yes, it happened to me once.

Q. Just once? A. And that was enough.

Q. That was enough? Now, it was the fault of the way you handled the bleacher, wasn't it? A. Yes, sir.

Q. Your miller?

A. Yes. Well, I don't know, I could not blame him.

Q. Well, somebody—the machine itself didn't work right, or something? You did not have that experience with the rest of the flour, the five years you used it?

A. Yes, I had some, sometimes, that the flour would not go so well, when there was a little too much on, but not after that; after that we didn't bleach the best part of our patent flour, at all.

Q. You did not? A. No, sir.

Q. What did you bleach?

A. We bleached the next grades, which we added to the patent.

Q. You mixed it? A. Yes, sir.

Q. You sold that then as a patent?

A. Of course I did.

Q. You could have done that, without bleaching it, couldn't you? A. No, sir.

781 Q. How?

A. No, sir. That is just what I could not do before bleaching.

Q. And you did do it, afterward?

A. Did, yes, sir.

Q. And you did sell this off day's run to a man, without telling him it was bleached, or that it was overbleached?

A. No, sir; he was a judge of flour, I guess.

Q. But you didn't tell him?

A. Why, no; why should I tell him?

Q. You haven't very great scruples about recommending your flour very highly, then, have you?

A. When I have nothing to recommend, what shall I tell

them for?

Q. Your flour isn't worth the recommendation, then?

A. That one item, yes, sir.

Q. You don't aim to make good flour, but to make flour you can get off your hands?

A. We mill, to make good flour,—as good as—

Q. (interrupting) But you couldn't recommend it?

A. Recommend it? Why, what in the world do you mean? Didn't I tell you that was only one item, what we sold? I pretend to make as good a flour as anybody.

Q. Do you want this jury to understand that you, a gentleman who has been in business in the city of St. Louis for forty

years—
A. (interrupting) Yes, sir.

Q. (continuing)—have been willing to perpetrate a fraud upon your customers, by mixing inferior flour with superior flour, and selling it as superior flour?

A. I didn't do anything of the kind.
O. You didn't do anything of the kind?

A. I sold it on the market, whatever it would bring. Sent my sample there, and the man offers me a price, and he can take it.

But you haven't been practicing fraud, at all? Q.

No. sir. A.

Now, you say that you quit bleaching the highest patent? 0.

Yes, sir. A.

And bleached the next grade? A. Yes, sir. Q.

What was the name of your highest patent that you sold Q. it under. A. "U. S. Standard."

"U. S. Standard?" Now, then, you bleached your Q. next grade? A. Yes, sir.

Q. That is clear flour, or a straight flour?

A. No, that wasn't the straight flour.

It was a clear flour, then, was it, or was it a patent flour?

A. It could not be a straight flour, because I had already taken so much patent away.

Then it was a clear, was it? A. No, sir. Q.

What was it? O.

It was a part of the extra fancy. A.

Well, was it a patent, or was it a clear? O.

A. It was no clear.

It was a patent, then? 0. No, it was extra fancy. Α.

Q. It was less? It was better than a clear, was it?

Yes, sir. Λ.

So that, when you bleached that, you wasn't bleaching a clear flour? A. No, sir.

Q. But you did bleach patent flour?

A. No, sir, I was bleaching-

(interrupting)—"Extra Fancy"? Is that it? I under-(). stood you to say that this extra fancy was what was left after you had taken 75 to 80 per cent of the best flour out of it?

Yes, sir, and it was extra fancy. Α.

Now, you bleached this extra fancy? A. Yes, sir. Q.

Which you say was better than a clear? 0.

Yes, sir, better than a clear. Α. What do you call a clear flour? ().

A clear flour is next to an extra fancy. Α.

Still below an extra fancy? A. Yes, sir, 0.

About what per cent do you get, then, of a clear, out of Q. your flour?

That depends altogether on how heavy I bleach it. .1.

Can you give us some figures. 0.

Now at present, I can give you the figures. 1. Q. Well, you are not bleaching now? A. No.

Q. You have reformed, to that extent?

We have never reformed at all.

783 Q. You haven't?

A. Why should I reform when everybody else bleaches?

Q. I don't know.

A. Well, you might just as well reform in your business and not ask me so many questions which I refuse to answer.

Q. You say you can give me the figures now. Will you please do it. A. I make 55 per cent patent.

Q. What per cent clear do you make?

A. I don't make any clear.

Q. What do you call it after the 55 per cent is taken out?

A. Low grade. Q. Low grade?

A. That is 55 per cent of it becomes patent, 25 per cent extra fancy, and the balance is a low grade flour.

Q. Well, you are familiar with what millers generally mean when they speak of "clear flour", are you not?

A. It differs, in different localities.

Q. The same as patent does, doesn't it? A. Yes, sir.

Q. You do not understand that there is any uniform patent, or any uniform clear standard, do you? A. No, sir.

Q. Not even of the low grade? A. No, sir. [A. No, sir.] Q. One miller will have more of one grade, than another?

A. Yes, sir.

Q. Now, what I want to get at is, what was the grade of the two flours. You mixed one part, which was bleached, and the other part was not?

A. I am telling you just as plain as I can tell you that, in order to compete with the trade, I had to take more patent—

Q. (interrupting) I am not asking you what your reason was, A. How is that?

Q. Go on. Perhaps you will get further, if I don't inter-

rupt you.

A. I had to make more patent, in order to compete with my neighbors in price, but that didn't enhance the value of the product a bit.

Q. Did it damage it? A. Why, of course it did.

Q. And still you sold it as "U. S. Standard"? A. Yes, sir.

Q. You haven't yet quite answered. I will try to make myself as clear as possible, as to what I want to get at.

784 A. I hope you did it.

Q. And we will soon be through. Now, I believe you stated, in answer to a question a moment ago that you quit bleaching your patent? A. Yes, sir.

Q. And that you bleached your extra fancy?

A. Yes, sir.

Q. And that you mixed this fancy with your patent and sold it as your "U. S. Standard". Is that the way you under tood it?

A. Let me explain something, there. What I mean, we stopped bleaching on the patent, so we made the finest grades of the patent. The balance, what turned a little bit yellow, I bleached, and then, as much as I could, I put into the patent off of that. That went with the patent.

Q. That is to say, with the wheat that you used down there, you got a certain, small percentage that don't need any

bleaching? It is white enough? A. Yes, sir.

Q. And then you take the next per cent below that. Can you tell the percentage?

A. No. I can't tell you the exact percentage.

Q. Will it vary with the different wheats? A. Yes, sir.

Q. And the different crops? A. Yes, sir.

Q. And how much do you take off, of this extra fancy, or high patent?

A. Just according to my judgment, so much, so it will be

the same looking flour.

Q. The fact is, you don't bleach any clear, at all,—what would be a clear, or low grade? You do, down to what could be made a high patent?

A. Oh, I could bleach the ship stuff, for that-matter.

Q. Are you acquainted with hard wheat that is raised in Kansas and Nebraska? Do you use that?

A. Why, yes, we use that.

Q. And you also use Missouri wheat? A. Yes, sir.

Q. Do you get any wheat from the south of you?

A. Yes, sometimes we get wheat from Kentucky and Tennessee, and sometimes we get it from Washington Territory, just according to how scarce it is.

Q. These wheats are not all alike, are they? A. No, sir.
Q. What is the difference between your Kansas hard wheat,

Q. What is the difference between and that Kentucky wheat?

- 785 A. Kentucky is a soft wheat. Kentucky is something similar to Missouri wheat.
  - Q. And that is softer wheat than the Kansas wheat?

A. Yes, sir.

Q. How does the color of the flour made from it compare?

A. That compares very good.

- Q. Which is the lighter—whiter flour—wheat flour made from a Kansas, turkey hard wheat, or made from the Kentucky soft wheat?
  - A. Well, I have never compared the two together.
    O. You have used both of them? A. Yes, sir.

Q. You don't know?

A. No, sir, not exactly. I found, again, there is a difference in Kansas wheat, also. If I grind Kansas wheat I prefer the Turkey wheat to the other.

Mr. Butler: To the yellow?

A. All of them. I prefer the turkey wheat to the other run of Kansas wheat.

By Mr. Helm:

Q. Does it make a slightly yellow or darker flour than the softer grades of wheat?

A. That depends a great deal on how you grind it, sir.

Q. Well, as a general run, does it? Is there that difference in the wheat?

A. If I grind it from one, I get a pretty white flour.

Q. Can you answer my question?

A. I am answering your question; I don't want to tell you something that I don't know.

Q. Take a carload of Kansas, turkey hard wheat?

A. Yes, sir.

Q. And take a carload of Kentucky soft wheat?

A. Yes, sir.

Q. Treat them both just alike. Is there any difference in the flour? A. Yes, sir, there is.

Q. That is what I am trying to get at. Which is the lighter. A. The Kentucky would be the whitest.

Q. That is all, sir. A. But not the strongest.

## 786

## Redirect Examination

By Mr. Butler:

Q. Judge Helm has asked you, when you reformed and quit bleaching and you told him you had not reformed, but you quit bleaching when the Government ordered you to stop?

A. Yes, sir.

Q. Now, when was that?

A. That was—I don't remember dates, but when the Government gave us six months' time to dispose of all the bleached flour, we stopped about a month after that.

Q. And that was 1909, in February, you stopped?

A. February 15th, we stopped.

Q. That was about a month after the order?

A. But there never was any reform.

Mr. Scarritt: What did he say? That he would have been bleaching yet if the Government hadn't stopped him?

Mr. Butler: He didn't say that to me, Judge Scarritt. Did he to you?

Mr. Scarritt: I thought that was what he meant.

Mr. Butler: Well, now, Judge Helm will find out what he means, if you will suggest some question to him. He knows how to do that better than I do.

The Witness: All right, come back at me now, because I will be gone tonight.

By Mr. Butler:

Q. Now, you told Judge Helm that sometimes you did not bleach the highest portions of your best patent, but only the lower portions, with the yellow? A. Yes, sir.

Q. And then you mixed them together, after you bleached

them, and sold them all for the patent? A. Yes, sir.

Q. That was the way you lengthened out your patent?

A. That was the way I lengthened out my patent.

Q. He asked you, then, if you couldn't do that before you bleached and you told him you couldn't. I would like for you to tell us why.

A. I couldn't because the flour would not turn that white.

Q. It wouldn't be white enough? A. No, sir.

Q. You have made a shorter patent?

A. We have to mill according to the fashion.

787 Q. Now, some of these millers divided their product into patents, clear, and low grade, and a man from Oklahoma made his division of patents—

Mr. Scarritt: Well I object to his commenting on the testimony of other witnesses.

Mr. Butler: I am not making any comments at all, I am calling attention to it.

Mr. Scarritt: Yes, you are.

Mr. Butler: I am just calling his attention to it; I am not commenting on it.

Mr. Scarritt: Ask him the fact you want.

By Mr. Butler:

Q. I am trying to find out what your extra fancy corresponds to—whether the clear, designated by others here, the bakers' grade referred to by the gentleman from Oklahoma—

Mr. Butler: That is what I am trying to get at, Mr. Scarritt.

Mr. Scarritt: You can get at it in a good deal shorter way.

Mr. Butler: Now, you do it, Judge. I would like to see you try once. We have had all the rest of them.

The Witness: Yes, sir.

By Mr. Butler:

Q. Now, after you take out the patent, you called the next extra fancy? A. Yes, sir.

Q. You did not call anything clear? A. No, sir.

Q. You did not call anything low grade?

- A. Yes, I always got low grade, after the extra fancy, unless I made a straight flour, then I don't have any extra fancy.
  - Q. And you don't have anything you call bakers' grade?

    A. No, sir. I simply have a straight flour, and a low grade.
- Q. Now, after this bleaching began, I understood you to say this extra fancy, then, was about 20 per cent?

A. Yes, sir.

788 Q. After you took out the patent? A. Yes, sir.

Q. That is, below the patent? A. Yes, sir.

Q. I understand somebody bought that from you, and put it into bags of his own?

A. Branded "Patent"; yes, sir.

- Q. Was the name of your mill, or your name on that bag, at all?
- A. No, sir, we had nothing to do with that. He simply bought it, and the property belonged to him, and he could brand it.

Q. Put his own name onto it, did he?

- A. I guess he did. He branded it what he pleased.

  O. He was a merchant? A. He was a merchant.
- Q. He branded that "Patent" did he? Did he call it a "High Patent", a "5-x", or a "4-x" patent?

A. I laughed [-] it, that it turned into a high patent, so

quick.

Q. Now, was that, after you got through bleaching it, so it looked without comparison—it looked white, did it?

1. No, that was after I shut down that bleacher.

- Q. How is that? A. That was after we quit bleaching.
- Q. That was after you quit bleaching that he took this and branded it?
- A. Yes, but it was a pretty nice looking flour; there was no low grade in it.

Q. No low grade in that flour? A. No.

Q. And no bleaching in it? A. No, sir, neither one.

Q. Now, something was said to you, just before Judge Helm sat down about this turkey hard Kansas wheat. Is that ground and milled—is it proper to grind a hard wheat in exactly the same way you would grind a soft wheat? A. No, sir.

Q. He asked you the colors of the flour, if you ground them exactly alike. Now, suppose you buy some Kansas turkey hard wheat, and use it to make a white flour, can you make

very white flour out of it?

A. Yes, sir, make pretty nice flour out of it.

Q. About as white as-

A. (Interrupting) Good enough for anybody.

Q. Yes:

A. But I wouldn't attempt to grind them the same as the soft wheat.

789 Q. You wouldn't get the right kind of flour if you did?
A. I wouldn't get the results.

Witness Excused.

F. Westerman, called as a witness on behalf of the Government, being first duly sworn, was examined and testified as follows:

## Direct Examination

By Mr. Butler:

Q. Where do you live, Mr. Westerman? A. Chicago.

Q. What is your business?

A. Manufacturer of crackers and cakes.

Q. Are you alone in business, or associated with somebody else? A. Associated with somebody else.

Q. What is the name of the concern?

A. A. F. Westerman & Co., or, Quaker Biscuit Works.

Q. How long have you been engaged in that?

A. About 13 years.

- Q. Does the Quaker Biscuit Works manufacture crackers, exclusively? A. Yes, sir.
  - Q. Are you, yourself, a practical man? A. Yes, sir.

Mr. Helm: Practical man?

Mr. Butler: I meant a pratical man in that line.

The Witness: I thoroughly understand the baking of them, and the mixing of the dough.

By Mr. Butler:

Q. What volume of business have you? About how much flour do you use in a year, very generally?

A. 12 to 15 thousand barrels.

Q. Do you use bleached flour? A. I have.

Q. Do you use it now? A. No.

Q. To what extent did you use blenched flour in your business?

A. Well, probably three or four thousand barrels.

790 Q. In how many years?

A. Well, I couldn't say about that.

Q. Well, two, or three, or four,—something like that?

A. Well, yes. I might have been using it before I got onto it that it was bleached, and used it before that.

Q. But there was 3 or 4 thousand you know were bleached?

A. Yes; I do know.

Q. What I am trying to get at, would be the proportion of bleached flour, as compared with the other, when you were using bleached flour? A. Well, I think I used about that.

Q. Does your experience with bleached flour enable you to give us an opinion as to the effect of bleaching upon the flour?

A. Yes.

Q. For cracker making uses, as compared with the same flour, not bleached—like flour, not bleached?

A. Flour of the same character?

Q. Yes, sir. That is what I mean. Now, describe to the jury your views about that.

Mr. Smith: Wait. I think we will object to that your Honor,—it is too general. He says "Give us your views about that."

Mr. Butler: You opinion, then.

Mr. Smith: Well, if he say "opinion", then I know the Court will sustain the objection.

By Mr. Butler:

Q. Well, give us the result of your experience, comparing the baking qualities, for cracker making, of bleached flour, and flour of like quality, unbleached?

Mr. Smith: Object to this, as incompetent, irrelevant and immaterial, and calling for simply a speculative opinion, as to the relative merits, which, I think, falls under your Honor's ruling of the relative odor or a relative taste.

The Court: Oh, no, I think not. He may answer.

Mr. Smith: Exception.

The Witness: It is inferior.

791 Mr. Scarritt: We move to strike that out.

The Court: Yes,-you must give your data-not an opinion.

The Witness: From an experimental stage?

By Mr. Butler:

Q. Yes. Tell us how it works, as compared with the

other-flavor, odor and taste?

A. I made a test on 1200 pounds or bleached flour and 1200 pounds of unbleached flour, both at the same time, and, after the process of fermentation—

Mr. Helm: (interrupting) Wait a minute. For the purpose of making an objection, I would like to ask the witness a question, whether or not these flours—

Mr. Butler: Now, just a moment, Judge Helm. I wish that counsel on the other side might arrange so one counsel would take charge of each witness.

Mr. Scarritt: He has charge of it.

Mr. Butler: I know. Then, if he has charge of it, Smith hasn't and you haven't. Now, when there are three lawyers trying to object—

Mr. Helm: We can't all keep up with you.

Mr. Scarritt: We have a right to object.

The Witness: (continuing) After the process of fermentation of both flours, I found that the bleached flour had a dark grey color, and of an inferior flavor to that of the unbleached flour, which had a far superior color, and had the natural flavor of the wheat.

By Mr. Butler:

Q. Were you able to observe the relative colors during the baking process?

Mr. Helm: I desire, Mr. Butler, to put in an objection.

Mr. Butler: Very well. Don't answer until counsel have an opportunity to object.

Mr. Helm: If your Honor please, I desire to object to this question, the same as I was trying to object to the other, 792 for the reason the witness hasn't shown where these samples of wheat and flour were obtained from—whether the bleached flour and the unbleached flour were produced from like qualities of wheat, by the same mill, or anything else. One is a bleached and the other is an unbleached, and they are not identified, and the testimony, so far, shows that there is a great difference, depending upon where the wheat is grown, and its quality, whether it is a hard wheat or soft

The Court: I think that goes to the weight of it, and not the admissibility. He may answer.

Mr. Helm: Save an exception.

By Mr. Butler:

wheat.

Q. You may answer, now, if you have the question in mind?

A. I found that there was a difference between them, in the flavor, and baking,—did you say?

Q. Yes. I asked you if you had opportunity to observe the colors of each before and during and after the baking process?

Q. Now, describe that change, in each case?

A. In the baking of the bleached flour, there was a difference in the color of the cracker, also a big difference in the flavor that was emitted from the oven during the process of baking.

When you say "flavor emitted from the oven", what do you mean?

The gases that were escaping from the crackers, while

they were in the process of baking.

Can you describe that condition?

Well, I would say that the flavor, as nearly as I could A. describe it, would be the same odor that you would get from a galvanizing works.

From which one was that? Q.

The bleached, while the flavor from the unbleached was the natural flavor of the wheat.

When you say "flavor", do you mean taste, or smell, in

this connection? A. The smell.

Now, during the baking process, was there any other change of color of either kind of crackers? A. Yes. Now, was the change alike in both kinds, during

793 the process of baking? I don't know whether I make my meaning clear. What I am trying to get at is this: After the cracker has been prepared to bake, and while it is baking, does it change colors, while it is baking? A. Yes, it does.

Now, did these change colors alike, or differently, and,

if differently, how?

The bleached flour made into dough, goes in dark, and bleached out white.

During the baking?

During the process of the baking. While the unbleached goes in with a yellow cast, and bakes out white, with also a slight color on the cheek on the cracker, yellow.

Q. Now, the final product. I would like to have you com-

pare the color-that is, when your crackers are done?

Well, we have a white, and one with a yellowish cast to the top.

Which is that?

The light would be from the bleached flour, and the

one with the yellow tops, would be the unbleached.

Now, with respect to the appearance of bleached flour Are you able to tell whether or not flour has been bleached, by an inspection of it, without a chemical test?

A. No.

Now, with respect to the effect upon grades, or your means of telling one grade of flour from another, it being bleached. What is the truth in that regard?

That is, comparing your bleached and unbleached, to-A.

gether?

Suppose some bleached flour were presented to No. Couldn't tell the difference.

Can you determine, by inspection of it, the grade of the flour? That is what I am trying to get at? A. No.

Q. What grades, all being unbleached, are the whitest?

A. So-called patents.

Q. In the case of bleached flour, is the color of the flour, itself, any guide to determine whether it is patent, or clear, or a long patent, or a short patent, or of the quality of the flour? A. Yes.

Q. How? A. By their different shades.

794 Q. I am speaking, now, of an observation of a single specimen of bleached flour.

A. It is lighter in color.

Q. It is lighter in color? Now, how do the colors of the clears or baker grades, lower than the patents, bleached, compare, generally speaking, with the color of the patents—the lower grades being bleached, and the patents not bleached.

Mr. Scarritt: Don't lead him.

Mr. Butler: No, I am suggesting what I want him to answer.

Mr. Scarritt: That is what I am objecting to. You are suggesting.

Mr. Butler: Well, I will withdraw that question, Judge Scarritt, and I will ask one that will be satisfactory to you.

Q. I want your opinion as to how the color compares, between two flours, one patent, not bleached, the other grades lower than the patents, like the clears, or baker's grades, bleached. A. The lower grades would look whiter.

Q. Than the patents? A. Yes.

Q. Are you familiar with the flours called "straight" flours?

A. Yes.

Q. Now, taking the same types of flours. I want to have you tell us which is the whiter,—a patent flour, or a straighter flour, unbleached? A. Patent.

Q. Now, assuming that the patent remains unbleached, and

the straight is bleached, which is the lighter?

A. Straight.

Q. Are you familiar with the natural aging of flour, after

it has been milled? A. Somewhat.

Q. You may tell us what, if any, changes occur in the color and quality of unbleached flour, upon its being stored and allowed to age and condition naturally?

A. The aging of the unbleached flour becomes lighter, and,

in aging it, it would absorb more water,-drying out.

Q. After it had aged? A. Yes.

Q. Have you observed whether or not like changes take place in cases of bleached flour, with the lapse of time, whether they, too, change, by aging and conditioning, and if so.

795 how?

A. No, I haven't noticed that on bleached flours.

Mr. Butler: I think you may cross-examine.

The Court: I think we will have to quit at this time.

Thereupon Court stood adjourned to 10 o'clock A. M., Friday, June 10, 1910.

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#### Volume 2.

### Morning Session.

Kansas City, Missouri, Friday, June 10, 1910.

Court met pursuant to adjournment and the further hearing of this cause was resumed as follows, to-wit:

F. Westerman, called as a witness on the part of libelant, further testified as follows:

#### Cross-Examination

By Mr. Smith:

Q. You run a bakery in Chicago? A. Yes, sir.

Q. Where is it located?

A. On Sangamon, between Austin and Kinzie.

Q. What is the name of the bakery?

A. Quaker Biscuit Works.

By the Court:

- Q. I have forgotten, where do you live? A. Chicago.
- Q. How long have you been running that bakery?

A. The Quaker Biscuit Works about thirteen years.

Q. Now what do you bake there?

A. Well, when we bake we start early in the morning.

Q. I said what? A. Crackers and cakes. Q. Anything else? A. That is all.

Q. Anything else? A. That is all.
Q. When you speak of crakers, describe that a little more fully; what do you mean, what do you call them?

A. The crackers consist of flour.

Q. No, what do you call the crackers as you put them on the market?

By the Court:

Q. What brand of crackers, water crackers, wafers or what?

A. Soda crackers.

Q. What name do they bear on the market?

A. Quaker crackers.

Q. Is there more than one kind?

A. Well, butters and oysters.

Q. Anything else? A. No.

- Q. If you would go to a grocery store here in Kansas
  City and wanted to get some of your crackers what
  would he call for? A. Couldn't get them.
  - Q. Can't find any of them in Kansas City? A. No.

Q. Well, where could be find some? A. Chicago. Q. Any place else? A. I don't think any place else.

Q. If we went in a store in Chicago and tried to get some of your crackers what would we call for?

A. Quaker crackers.

Q. Just Quaker crackers? A. Yes.

Q. Can we get more than one kind of Quaker crackers?

A. You get a soda, get a XXX soda, might get oat meal crackers and the graham.

O. You make out meal crackers, do you? A. Yes, sir.

Q. And graham? A. Yes.

- Q. But you don't think we can find any of those in Kansas City? A. I do not.
- Q. Now what kind of flour do you purchase as a rule in your business? A. Indiana, Missouri and Michigan.

Q. Well, patent flour, straight, clear or what?

A. Straight and patent.

Q. Straight and patent. Where did you buy your last flour? A. The last flour—Joplin.

Q. Missouri? A. Yes, sir.

Q. From whom? A. Dunwoody. Q. What was the grade of that?

A. That was a second patent.

Q. How much did you purchase there? A. 300 barrels. Q. Was it bleached or unbleached? A. Unbleached.

O. Are you sure of that? A. Absolutely.

Q. So provided in the bond, was it? A. How is that?

Q. So provided in the contract? A. Yes, sir.

Q. How long since you bought any bleached flour?

A. Oh, over a year ago.

Q. Where did you buy your last bleached flour?

A. Meyers of East St. Louis or Springfield.

Q. Springfield, Illinois? A. Yes, Q. How much did you buy then?

A. Well, I have been buying off and on, I don't know how much I bought.

Q. How long have you been using bleached flour?

A. I don't know.

- Q. Well, how long have you been using it to your knowledge? A. Occasionally.
- Q. Well, can't you tell how long you have been using it to your knowledge; how long have you known that you have been using it? A. The reason I can't tell—

Q. No, listen to my question, how long have you been using it to your knowledge? A. Can't answer the question.

Q. I see, do you attend to the baking? A. I do.

Q. Well, now, if you used any bleached flour in the oven didn't you know it?

A. I did not carry on any experiments.

Q. My question is when you used bleached flour in the oven baking crackers couldn't you tell it?

A. Generally, I could, yes,

Q. Well, didn't you know it all the time? A. No.

Q. Why couldn't you tell when you opened the oven that there was something wrong with it?

A. Not until I found that the standard cracker were being impaired for the flavor.

Q. But you couldn't tell it when you opened the oven?

A. The oven was always open.

Q. Well, couldn't you tell by the odor that you were using bleached flour? A. I certainly could after a while.

Q. How long did it take you to get on to that?

A. It took some time.

Q. How long?

A. I could not give the exact number of days.

Q. When was it that you found it out? A. 1898.Q. In 1908 you mean, don't you? A. Or 1908, yes.

Q. 1908 you found it out, when was it in 1908 that you found it out? A. Sometime about December.

Q. Whose flour were you using then? A. Meyers. Q. And Meyers is where? A. Springfield, Illinois.

Q. Meyers of Springfield, Illinois, and it was the latter part of the year 1908 while you were using Meyers' flour shipped from Springfield, Illinois, that you first discovered you were using bleached flour, is that true?

A. Yes, sir.

Q. Do you know whether or not you had been using it before that? A. No.

2. You don't know whether you had or not? A. No.

Q. You are not prepared to say that you had or had not used it before that, is that right? A. Yes.

Q. Why couldn't you tell before that whether you were or

not? A. The reason why?

Q. No, no, that is not my question, I am not asking for the reason; I am asking for the fact. Couldn't you tell before that whether or not you were using bleached flour, if you could not, all right, say so?

A. Before 1908?

Q. Before the latter part of the year 1908?

A. I don't think I had used it.

Q. Do you know whether you had or not?

A. Not absolute positive.

Q. You couldn't tell then whether or not you had?

A. No.

Q. I see. Now you performed some baking tests you said I think you said using 1200 pounds each, was that?

A. Yes.

- Q. Did I get the figures right, I don't want to misquote you; you [—] 1200 pounds of the bleached and 1200 pounds of the unbleached? A. Yes.
  - Q. And baked it all at the same time? A. Yes.
    Q. Now where did you get that flour? A. Meyers.

Q. Both kinds? A. No.

Q. Well which did you get from Meyers?

A. The bleached.

Q. What was the name of that flour you got from Meyers?

A. Silver Leaf.

Q. Silver Leaf, is that right? A. Yes sir.

Q. And you got that in what month and what year?

A. Well, I wouldn't say just the month, but I was using it in 1908.

Q. What time in 1908?

A. Oh, somewheres around December.

- Q. All right, that was the bleached flour, was it?
  A. Yes, sir.
- 800 Q. Now where did you get the unbleached?
  A. Joplin, Missouri?

Q. From whom? A. Dunwoody. Q. And when did you get that?

A. Why, coming about December, somewheres along there.

Q. Of 1908? A. Yes, sir.

- Q. When you bought this from Myers the Silver Leaf in December, 1908, or about that time, did you know it was bleached?
  - A. That is where I was deceived.

Mr. Smith: I move to strike that out as not responsive to my question.

The Court: Yes, it will be stricken out.

Q. The question is when you bought it, did you know it was bleached? A. No.

Q. How did you find it out?

A. By experimenting with it.

Q. What experiment did you perform to ascertain whether or not it was bleached?

A. Mixed up the doughs and looked-

Q. Any other way?

A. And looked for the flavor and results.

Q. Any other way? A. No.

Q. Did you test it with anything? A. No.

Q. To ascertain the presence of nitrites? A. No.

Q. Did you have it tested? A. No.

Q. Well, then do you know as a matter of fact that it was bleached?

A. They acknowledged it.

Q. My question is did you know it?

A. Yes, I know it.

Q. All right; you know it because they admitted it to you afterwards, is that right? A. Yes.

Q. Is that the only way you know?

- A. And from general tests and from the flavor I got from it. Q. Well, now was the flavor of that flour different from
- any that you had received from Meyers before that time?

A. Yes.

Q. Then you had never got any bleached from Meyers before that?

A. Some shipments, yes, I think I had.

Q. When were those shipments?

A. Well, buying off and on from them I just can't tell 801 the date.

Q. Have you bought any from Meyers since that time?

A. I have.

Q. Bleached or unbleached? A. Unbleached.

Q. Now do you know whether or not prior to December 1908 or about that time you had ever received from Meyers any bleached flour? A. Prior?

Q. Yes. A. No.

Q. That is, you don't know you mean?

A. I don't know.

Q. Was this flour that you got in December 1908 different from that which you had received from Meyers before that time? A. Yes sir.

Q. Now what was the character of this you got in December, 1908?

A. Straight or second patent.

Q. What do you mean by second patent?

A. Oh straight I call second patent?

Q. And stright, of course, means the whole flour from the wheat, doesn't it?

A. Well, yes, not the whole thing.

- Q. As a matter of fact what do you mean by straight?
- A. I think about 5 per cent of low grade taken out of it. Q. I say as a matter of fact you never bought any high grade flour, do you?

A. The best that I can buy, high grade.

Q. Well, you don't call straight a high grade flour, do you? A. Second patent, yes, I do.

Q. Is that the highest grade flour you can get?

A. No, get one better.

Q. Now as a matter of fact you never bought from Meyers his best flour in your life, did you?

A. Yes, sir, I did.

- Q. When was it in December 1908?

  A. No. since then, I think this year.
- Q. Well, in December, 1908, when you got this flour you knew it was not a high grade flour, didn't you?

A. I knew it was not the highest grade.

Q. As a matter of fact cracker men do not use the highest grade flour making crackers?

A. Yes, sir, they do.

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Q. You don't, do you? A. I do. Q. You were not then, were you?

A. I had other flours besides that.

Q. Did you mix? A. I did.

Q. You get flours and blend them, do you, one or two kinds, that is you buy different kinds of flour and you mix them, is that it? A. Yes.

Q. Did you do that in this case? A. No, sir.

- Q. You are using this second grade straight or second patent of Myers just by itself, were you? A. Yes,
- Q. Now what was the flour that you got from Joplin with which you made the comparison, what grade of flour was that?

A. That was the straight.

Q. That was the straight. Now do you know whether or not that was bleached? A. That was unbleachd.

Q. How do you know?

A. Because I bought it unbleached; I had it branded unbleached, shipped unbleached and billed as unbleached.

Q. Well, you knew before that time that they were bleaching flour, did you? A. Who.

Q. Different millers. A. I finally found out, yes.

Q. Well you knew it before you bought this, didn't you?

A. When I made that purchase I did, yes.

Q. Well, now, when you made up this test about the baking you say you made 1200 pounds of each? A. Yes.

Q. What were you making? A. What the makes were?

Q. Yes, what kind of crackers were you making?

A. Sodas.

Q. I see. Did you bake them all at the same time?

A. Alternately, yes, first six barrels of one and six of the other.

A. I am coming down now to the day when you made these tests, how much flour did you mix up on that day.

A. 1200 pounds.

Q. Of each? A. Of each.

Q. That is you took 1200 pounds of the unbleached flour and mixed it up to make crackers, did you? A. Yes.

Q. And you took 1200 pounds of the bleached and 803 mixed it up? A. Yes sir.

Q. To make crackers, make the same kind of crackers?

A. Yes.

- Q. Now you personally attended to the mixing of this, did you? A. I did, yes.
  - Q. Did all that work yourself?A. I did not do the work, no.

Q. But you superintended it? A. I did, yes.

- Q. All right. Now how do you bake, with what kind of an oven? A. Reel.
- Q. Well, what kind of heat, did you have wood or coal or gas or electricity? A. Coal.

Q. It is a soft coal range is it? A. Hard.

Q. Hard coal range. Well, now, what did you put in the oven first? A. The bleached.

Q. Did you bake that by itself? A. I did.

Q. Anything else in the oven at the time? A. No. Q. And then when you got that what did you do?

A. Started on the unbleached.

- Q. Now these flours came from different individuals, different mills? A. Yes.
  - Q. Well, you know nothing about the wheat? A. No. Q. You don't know how long they had been ground?

A. No.

Q. You don't know anything about the amount of nitrite that was in the flour that you got from Meyers? A. No.

Q. Is that right? A. Yes, sir.

Q. Now were you making exactly the same kind of crackers?

A. The same kind exactly.

Q. Did you have more than one kind in the oven? A. No.

Q. Are these crackers flavored any way? A. No.

Q. They did not contain any flavoring matter of any kind?

A. None whatever.

Q. Just the flour and water, is it?

A. Flour and water and lard.

Q. How is that? A. And lard.

Q. Well, now you say you could detect the difference in the odor? A. Very distinctly, yes, sir.

804 Q. Could you detect the difference in the odor of the flour before you put it in the oven? A. No.

Did you try it, did you sample it?

A. I sampled it, yes.

Q. Did you smell of the flour, the bleached and the unbleached before it went in the oven? A. No, not on that I did not.

Q. Did you ever on any? A. I did.

Q. Can you tell the difference between bleached and unbleached flour by the odor? A. No.

Q. Is there any difference between the bleached and the unbleached flour so far as you have been able to observe?

A. Never smelled it.

Q. Didn't you say you had tried it before that?

A. I tried it, sampled it up, we call it.

Q. As you sampled it is there any difference in the odor between the bleached and the unbleached flour?

A. Not by the odor, I did not sample it for that, only for

color.

Q. There is a difference in the color, isn't there?

A. Yes.

Q. You said you had sampled it for odor, hadn't you, before that time? A. Not for odor.

Q. Well, you smelled of it, haven't you, to see how it

smells? A. Well, I presume I have.

Q. Now from the smell when you had done it before that could you detect whether or not it was bleached or unbleached by the odor of it? A. No.

Q. You could by the color, though, couldn't you?

A. Being bleached?

Q. Yes, sir. A. Only taking it for the higher grade.

Mr. Smith: I move to strike that out as not responsive; these volunteer statements you can get later.

The Court: It will be stricken out.

Q. Can you tell by the color whether or not it was bleached? A. Yes.

Q. What is the difference in the color? A. Whiter.

Q. Is that plain to be seen? A. Very plain.

Q. You can tell that every time you look at it, can you? A. I think I can.

Q. Well, can't other people too? A. I don't know.

Q. Have you any special skill or knowledge that way that other people do not possess?

A. I think I have in this grade of flour.

Q. Have you such skill in the purchase of flour that you can tell by the looks of it whether or not it is bleached?

A. Not always.

Q. Did you ever get fooled on them in your life?

A. Yes.

Q. When? A. In being bleached flour.

Q. Whose flour? A. Meyers.

Q. Wasn't the color there very distinct?

A. Not at the time I couldn't tell, because I had nothing but bleached flour in the house.

Q. I see. When was it you got that flour from Meyers that he fooled you on? A. Well, sometime in 1908.

Q. 1908, was it this December flour?

A. No, the shipment came before that.

Q. Shipment came before that and then you can't tell by the color of flour whether it is bleached or not, can you?

A. If I have the unbleached I can.

Q. When you put the two together then the difference is plainly distinguishable, is it?

A. I think it is, yes, sir.

Q. But without, you can't tell from the color of flour whether it is bleached or unbleached, can you? A. No.

Q. I see. Now what was the odor of the baking of crackers, that you refer to, how did it smell like?

A. Coming out the oven?

Q. Yes.

A. Well, I describe it the same as a plating concern, galvanizing factory.

Q. Sort of a galvanized iron shop, is that it? A. Yes.

Q. Very pronounced, was it? A. Very. Q. Almost made you sick, didn't it?

A. Not exactly, no; didn't get enough of it. Q. Well, it was nauseating, wasn't it?

806 A. Well, I wouldn't say what.

Q. Well, it smelled decidedly bad, didn't it?

A. It did.

Q. And as you say the oven doors are open all the time?

A. All the time.

Q. Well, as the air would sink over it and the fumes came out it was very very pronounced, wasn't it?

A. After the oven got filled with the gas, out it came.

Q. And as near as you can describe it it smelled like a galvanizing iron work shop, is that it? A. Yes, sir.

Q. Anybody could tell it, couldn't they?

A. Anybody, we all knew it.

Q. If anybody stepped into the room where they were baking that bleached flour bread they detected it suddenly, wouldn't they? A. Yes.

Q. A man, woman or child could tell it, couldn't they?

A. Not child I don't think.

Q. Well, any man or woman could?

A. Or any man [-] had any experience.

Q. And any woman that is used to baking bread could tell it, couldn't she? A. I would not say to that smell.

Q. What? A. I wouldn't say as to a woman,

Q. Well, don't you think women who are accustomed to baking bread can tell those things about as quickly as you can? A. No.

Q. Well, was this difference then so delicate that you think an ordinary housewife could not detect it?

A. Not a house wife but a baker could.

Q. Oh, it was not so pronounced then that a woman in the kitchea would be able to detect it you think?

A. Oh, any one that baked could tell.

Q. A person accustomed to baking the family loaves of bread in the kitchen? A. No.

Q. But that woman couldn't tell about it? A. No.

- Q. It takes the exceedingly sensitive nose of a baker to detect that does it? A. Not absolutely, no.
- 807 Q. Then it was not very pronounced if a woman in the kitchen could not determine it, was it?

A. Well, experienced bakers.

Q. Don't you think a woman in the kitchen could determine the smell of a galvanized iron work shop?

A. I don't know that she had the experience with a galvan-

ized iron shop.

Q. Did you ever have any experience with a galvanized iron work shop? A. Yes, lots of it.

Q. When was it, there in your bake shop?

A. About 15 years ago or twenty.

Q. Now what I want to get from you, Mr. Westerman is this, was the difference in the odor there so marked that if a person who had not been a baker, but an ordinary person in the ordinary walks of life had come there in your bakery, would they have been able to detect any difference in it?

A. They could, yes.

- Q. All right, and they did not require an experienced baker to do that would it? A. Not for the difference, no.
- Q. If this jury had come into that place at that time do you think they could have detected it?

A. They certainly could, yes.

Q. It was so pronounced as that, was it? A. It was.

Q. Now was it due to the fact that you had such a large amount there? A. That is it exactly, yes.

Q. By baking 1200 pounds you think you are able to detect the difference? A. Yes.

Q. Now, did you ever perform any other experiments with that?

A. Not direct experiments but I found the flour that we used up afterwards the same.

Q. Did you ever buy any bleached flour after that?

A. Never.

Q. Have you bought any flour of Meyers since that?

A. Yes.

Q. Bleached or unbleached? A. Unbleached.

- Q. Now to whom did you first make known the fact that you discovered this great difference between the bleached and the unbleached? A. To the broker.
  - Q. Who was that? A. A party by the name of Smith.

Q. Where? A. Chicago.

Q. What is his address?

- A. Now I could not give you his address right this minute, he is a broker there—Smith & Company.

  Q. Smith & Company, where will we find them?
- A. I would have no difficulty, his office is at Lake near Franklin Streets.

Q. Have you dealt with him since? A. Oh, yes, yes.

- Q. But you can not give me his address any more definitely than that?
- A. Well, it is along Lake and Franklin, I don't know, I don't know, he moved here.

Q. Did you return any of this flour to him?

A. I did not, it was already paid for.Q. So that you used it? A. We used it.

Q. Now did you make any complaint to any other person?

A. Oh, I have yes.

Q. Since that? A. I think I have.

Q. When did you first make known to the Government or any of these parties your experience with this flour?

A. Why, I think somewheres around right after that-1908.

Q. You made complaint? A. I did, yes. Q. To whom did you make complaint?

A. Secretary Wilson.

- Q. You sent him a written communication? A. I did.
- Q. Complaining of the patent or bleached flour? A. Yes. Q. I see. Now you had used it before this time, hadn't

you? A. I did.
Q. Have you used it since? A. No.

Q. Do you store flour there at your bakery? A. Yes.

Q. How long? A. Well, that is hard to tell.

Q. Well, about how long?

A. Oh, from six to eight weeks, probably.

Q. Where did you store it?

A. In the basement of the warehouse, ground floor.

Q. Now have you ever noticed what was the effect upon flour that you stored there in your warehouse as to whether it acquired any of these properties of bleached flour or not?

A. I don't think it did.

Q. Have you ever tested any of it to see?

A. Well, I have at times just as to color.

809 Q. What is the effect of storing on the color?

A. Well, it may bleach a little.

Q. Does bleach it some, does it? A. A little, yes.

Q. Then after you store it in your warehouse there for a while you have got bleached flour then haven't you?

A. The color bleached, yes.

Q. You don't know the difference between the natural bleach and the artificial bleach so far as imparting anything to the flour do you? A. Imparting?

Q. Yes sir. A. I don't think I do.

Q. You don't know anything about that. I believe that is all. You said this was Springfield, Illinois, did you not?

A. Yes.

Q. And the other one was at Joplin, Missouri?

A. Joplin, Missouri.

#### Redirect Examination

By Mr. Butler:

O. Is there a Meyers at Springfield, Missouri, too?

A. Springfield, Missouri, yes, they got an office at St. Louis, too.

Q. This same Meyers had a place at Springfield, Illinois,

and at Springfield, Missouri?

A. No, I made a mistake, that is Springfield, Illinois, I think, if I am right.

Q. At any rate, it is Springfield, Missouri, or Illinois?

A. Yes, sir, either one of those.

By Judge Helm:

- Q. Don't you know which, whether it is in Missouri or Illinois?
- A. It is either one or the other, Springfield, Missouri, I know they have their office at St. Louis.

Q. But you don't know where their mill is?

A. No, I do not.

By Mr. Butler (resuming):

Q. Now you bought through a broker? A. Yes sir.

Q. Now in the taking of the 1200 pounds of bleached and 1200 pounds of unbleached, did you bake up all the 1200 pounds at once of each kind or did you bake alternately a part of each? A. 1200 pounds of each.

Q. 1200 pounds of each? A. Yes.

2. You baked the whole 1200 pounds at one lick?

A. No, not at one lick, no.

810 Q. That is what I was trying to get at?

A. No, kept right on baking them in until it is baked.

Q. You kept putting in the bleached until the bleach was all gone and then the unbleached?

A. First the bleached and then the unbleached.

Q. Yes, until it was all gone. You told Mr. Smith that you couldn't tell the difference between the unbleached and bleached flour on one occasion because you had nothing but bleached in the house; what did that have to do with it?

A. I could not detect from the colors of the flour in com-

paring them together.

Q. Well, how did you detect it when you have both kinds?

A. Well, they both look alike, that is when I had all

bleached.

Judge Scarritt: That is, all bleached flour looks alike, is that right?

Mr. Butler: Yes.

Q. Well now how would having unbleached flour aid you in telling bleached flour?

A. It would have that yellow east to it.

Q. And how do you compare the colors, what method do you employ? A. How is that?

Q. How do you compare the colors, what method do you employ, how do you do it, look at one—

A. Then the other, put them both side by side and slick them down.

Q. And slick them down? A. Yes.

Q. You couldn't tell that you had bleached flour because you had no unbleached to compare with it?

A. That is it, I could not under those conditions.

Q. That is all.

# Recross Examination

By Mr. Smith:

Q. I just want to be sure that I got the names of these parties and their location, Meyers you say is at Springfield, Illinois? A. Yes.

Q. And the name of his flour was? A. Silver Leaf. Q. And the man at Joplin, what was his name?

A. I beg pardon on that, that was "Puritan" and the Joplin was "Silver Leaf".

811 Q. Puritan? A. That is it.

Q. And the Joplin is Silver Leaf?

A. Silver Leaf, yes, that is right.

Q. And what was the man's name at Joplin?

A. The Dunwoody Milling Company I think it was.

Q. And the grade of the flour that you got from Springfield was what you call a straight or second patent?

A. A straight.

Q. Straight, and what was that you got from Joplin?

A. The straight.

Alexander Taggart, called as a witness on the part of libelant, being duly sworn, testified as follows:

#### Direct Examination

By Mr. Butler:

- Q. Mr. Taggart, where do you live? A. Indianapolis.
- Q. What is your first name? A. Alexander. Q. Alexander Taggart. What is your business?

A. Baker.

Q. How long have you been a baker?

A. Over fifty years.

Q. What is the name of your concern?

A. Taggart Baking Company.

Q. And about the volume of it, what do you bake-bread?

A. Bread mostly.

O. What is the volume of your business your daily output?

A. You mean in barrels of flour or-

- Q. In barrels of flour and loaves of bread?
- A. Well, about 150 barrels of flour a day, and about a little over 35,000 loaves of bread.
  - Q. And where do you find a market for your bread?

A. Mostly in Indianapolis.

Q. Do you yourself now give attention to your business?

A. I do.

- Q. Were you formerly a practical baker?
  A. Yes, I worked at it for 20 years.
- 812 Q. What is your age? A. 66. Q. And is the bakery company a corporation?

. It is.

Q. Are you one of its officers? A. I am.

Q. What office? A. The treasurer.

Q. Now what do you have to do now with the observation

of the quality of bread at your place?

- A. I have a general superintendence of all the stuff that is manufactured, the bread and crackers especially, there are samples of all the bread made brought into my office every day and it is a part of my duty [is] to examine that bread.
  - Q. Have you had any experience with bleached flour?

A. I have.

Q. When was that and to what extent?

A. About four years ago.

- Q. Do you now purchase bleached flour? A. No, sir.
- Q. Did you ever purchase bleached flour regularly, sir?

A. Not knowingly.

Q. Do you sometimes store flour at your place?

A. We do.

Q. Have you had opportunity to observe the effect upon the color and quality of flour resulting from aging or storing, I mean flour that is not bleached? A. I have,

- Q. Have you also had opportunity to observe the effect on flour of bleaching as to its bread making qualities?
  - A. Yes.
  - Q. You may describe that?
- A. One morning about four years ago when I went in the office—

Judge Scarritt: We object to that. He asked him to describe the method not what he did a morning four years ago.

Mr. Butler: No, I did not intend to ask you.

Q. You may describe the effect on the bread making quality of bleaching, the effect is very different from the method.

Judge Scarritt: That is what we object to.

Q. Well, when was it, you need not tell whether it was in the morning or afternoon.

A. On examining the bread made the night previous I found the bread was not of the quality that it had formerly been. Naturally I examined it more closely. I cut it open; I smelled of it, and I examined the color, and I found that instead of having the color that we had had the day before, it was an entirely distinct color, that it had a nasty, slaty color, and that when you smelled the bread as bakers do, to get the flavor, there was an absence of the flavor that ought to be there, and I then inquired what kind of flour this was made of.

Judge Scarritt: Now wait a minute.

Q: Where had you been buying your flour?

A. Well, we buy flours from various mills, sir. We buy from W. J. Jennison & Company of Appleton, Minnesota; we buy from Stokes Brothers, let me see there, we buy from several mills, I really don't remember them all; we buy from a number of mills in the Northwestern country, and also from Atchison, Kansas, and from Indianapolis and from Southern Indiana, and from Michigan; we buy flour of other mills.

Q. Where did this flour come from?

A. It came from W. J. Jennison & Company of Appleton, Minnesota.

Q. And that was in what year?

A. About four years ago-1906.

Judge Scarritt: Four years ago,-1906.

Q. You remember the season of the year?

A. Well, I think it was about this time, a little earlier than this, probably during the early spring.

- Q. Did you have any other occasion at which you observed this effect in your bread?
  - A. Not in our bread, but in our crackers.

Q. When was that?

A. The first of that was two years ago about.

Q. Where was that flour procured?

A. From George T. Evans & Son, Indianapolis.

Q. That is your own city? A. Yes.

Q. What did you observe in that regard?

A. I observed that the crackers instead of being the brittle, nice, rich appearance, that they were slaty and baked hard, and when you tried to dissolve them in water they would not dissolve as they had been doing formerly.

814 Q. What kind of flour, brand of flour was that you got from Evans, do you remember its name?

A. It is their patent.

Q. Were you familiar with that brand of flour?

A. I was.

- Q. And had you been using it?A. I bought it for thirty years.
- Q. And with respect to this flour that you bouught at Appleton, Minnesota, what brand was that? A. Their very best.

Q. And had you been familiar with that brand?

A. We had.

Q. For how long? A. Oh, for years.

Q. Have you had any other experience with bleached flour?

A. Yes, sir.

- Q. When was that?
- A. That was about 18 months ago, probably a little over, 1 don't remember the exact date of that.

Q. Whose flour was that?

A. It was made at the Genessee Milling Company from Flint, Michigan.

Q. What brand of flour was it?

- A. It was supposed to be a high grade winter, they branded it "H H" or we did rather to define it.
  - Q. Now you may describe your experience with the flour?

A. Well, that was—the crackers we found were in the same condition as they had been with the Evans flour; they were flinty instead of being brittle and crisp.

Q. Now as to the odor and taste of the bread when bleached as compared with the unbleached, can you tell us about that?

A. Well, the odor from the bread would be scarcely discernible, because the bread was cold, you see, when I examined it, so that the odor would be scarcely discernible. Taste is such a peculiar thing that it is hard to describe it. I can only tell you in this way that if you are eating a piece of bread on the table, if the bread is good, you eat a lot of it; if it is

poor, you only want one piece, that is from the absence that you get from the good flavor. Now this bread that is made out of bleached flour has an absence of the good taste or the good flavor.

Q. Now with respect to the odor and taste of crackers

815 from bleached flour?

- A. Well, I could say but little about the odor; the taste was—you see crackers are salable only when they have a good rich flavor, and the crackers made out of bleached flour did not have that flavor.
- Q. Now in addition to these occasions that you have referred to, have you had any other bleached flour?

A. No, sir, not that I know of.

Q. Are you familiar with the color of flour, the natural?

A. I am.

Q. And unbleached. In cases of unbleached is the color of any value in determining the quality of the flour?

A. Yes, sir.

Q. How so?

- A. Well, when you get a rich patent flour, it has a yellow white—has a white color, with applittle yellow streak running through it, it gives it a rich appearance, the color has to be white or you can not, well, else it would not be a high standard flour.
  - Q. You said yellow streak; did you mean streak or shade?

A. Shade, yes, I should not say streak.

Q. Did you use soft wheat flour too? A. Yes sir.

Q. From what region?

A. From Michigan, from Southern Indiana, and from Central Indiana.

Q. Any hard winter wheat flour?

A. Well, we use a little hard winter we use some hard winter from Kansas.

Q. Any hard spring?

A. That we get from Dakota and Minnesota,

Q. Now of these three kinds of flour, the soft flour in your own region, the hard winter from Kansas, the hard spring from Minnesota, which is the whitest flour of light grade? A. Well, I should say the soft winter.

Q. And the next whitest to the soft winter?

A. The Kansas.

Q. And the next? A. And the Minnesota.

Q. Spring? A. Yes, Minnesota spring.

- Q. So then of the three kinds that you got the soft wheat produced the whitest flour? A. Yes, sir.
- Q. The Kansas hard next and the Minnesota spring hard next? A. Yes.

816 Q. Now as respects the strength of the flour—elasticity?

A. Well, the northern, the Dakota and Minnesota flours are the strongest.

O. And the next? A. The Kansas.

Q. And the next?

- A. The soft, the Indiana or Michigan winters. Q. The soft wheat? A. The soft wheat, yes, sir.
- Q. So then the whitest wheats are the least strong?

A. With us, they are, yes sir.

Q. And strength seems to keep pace with color, that is, the white flours are the weaker, and as color increases the strength does as far as those three kinds that you have spoken of? A. That is right.

Q. How long have you been familiar with these three kinds of wheat flour—flour made from these three different kinds of

types of wheat?

- A. I have been familiar with the Indiana soft wheats ever since 1865, with the Kansas or Nebraska wheats since 1880, and with the northern, the Dakota and the Minnesota well, I would say 25 years ago, since 1885, probably a little before that.
- Q. What kind of wheat employed by the Evans mill at Indianapolis was used?

A. Well, they are supposed to grind Indiana wheat mostly.

Q. You know Mr. Evans, do you?

A. Well, the old gentleman is dead; I know the son very well.

Q. Did you know his father? A. Very well.

Q. Being connected with the mill. Do you know the particular kind of bleaching machine he had in?

A. Well, I know it is some kind of an electric bleacher, that's all, the son told me, that's all I know about it.

Judge Scarritt: We ask that that be stricken out, what his son told him.

The Court: He said "I know some kind of electric". That may stand. What the son told him may go out.

Judge Scarritt: It is all the same thing.

The Court: Let it all go out.

By the Court.

Q. That is all you know what his son told you?
A. Yes, sir.

817 By Mr. Butler:

Q. You never saw the machine yourself?

A. Never; he asked me to come to see it.

- Q. You know the Alsop bleach? A. No, sir.
- Q. You are not familiar with it?
- A. No, sir, not familiar with any bleacher.

Judge Scarritt: I want to move to strike out all of this witness' testimony, for the reason that it pertains in no way to the issues made by the pleadings in this case, in that all his testimony does not refer in any instance to the flour in question or to the bread made from the flour in question, or to crackers made from the flour in question, and does not pertain in any way to the flour in question or to the mill or process in question.

The Court: Which motion is overruled. To which claimant then and there duly excepted.

#### **Cross-Examination**

By Mr. Smith:

- Q. Mr. Taggart have you ever had any experience in using either Kansas or Nebraska hard wheat bleached? A. No, sir.
- Q. You never had any flour that came from the Lexington Mill and Elevator Company at Lexington, Nebraska?
  - A. No, sir.
- Q. And have you had any experience in the use of any flours that was made from Nebraska wheat so far as you know?
  - A. Do you mean bleached or unbleached?
  - Q. Either one that came from Nebraska wheat? A. Yes.
  - Q. Where did it come from? A. Nebraska City.
  - Q. Sminkey's mill? A. Sminkey's mill.
  - Q. How long ago? A. Oh, 25 or 30 years ago.
  - Q. You have not had any in the last 25 years?
  - A. No, sir.

Q. Have you had any experience in the use of any Kansas

wheats that were bleached? A. No, sir.

Q. You don't know anything about what would be the relative bread making qualities then of any hard wheat of Nebraska or Kansas that was bleached or unbleached, do you?

A. The unbleached, yes.

- 818 Q. Well, I say you never had any experience in the comparative value of Nebraska wheats that is bleached and Nebraska wheat that is unbleached? A. No, sir.
  - Q. And that is true of Kansas, isn't it? A. Yes, sir.

Q. And it is true of Missouri, isn't it? A. Yes

Q. So you are not able to tell the jury anything about what would be the result on the bread making qualities of the wheats coming from either of these states if it was bleached?

A. That is right.

Q. Have you ever purchased any wheat from any mills here in Kansas City? A. You mean flour or wheat?

Q. Flour, I beg pardon? A. No.

Q. You never received any wheat from them that was bleached, flour from [—] that was bleached?

A. I never purchased any.

Q. Well, have you ever purchased any from a broker that was milled at Kansas City?

A. No, never buy from brokers.

Q. Now this flour, bleached flour, that you had your experience with four years ago was what kind of wheat?

A. It was supposed to be northern spring.

Q. And do you know by what process it was bleached.

A. No. sir.

- Q. Do you know anything about the extent to which it was bleached? A. No, sir.
  - Q. What I mean is did you have any test made of it?

A. No.

- Q. How did you ascertain that it as a matter of fact had been bleached?
- A. Because their agent, whose name I suppose you want to know, Robert Pythian was the agent of the W. J. Jennison Company, in Indianapolis, I sent for him and told him that this flour was bad; I didn't know what was the matter with it; I had never had experience with bleached flour; he wrote the mill immediately and the mill sent back a letter, he showed me that the flour was not off grade but had been slightly bleached.
  - Q. I see, and that is the way you ascertained it?

A. That was it, yes.

Q. Now the effect of this slightly bleached was to whiten the flour?

819 A. I did not examine the flour particularly. I spoke with reference to the sale of it, being baked in bread:

Q. You don't remember having seen the flour at all?

A. Well, a small quantity I examined afterwards.
 O. Well, was it whitened by the bleaching process?

A. Well, I doughed it, and then in the doughing it was not any whiter but it was a soft putty dough.

Q. Do you know how long the flour had been milled?

A. Oh, I don't know, probably we had it in the house probably three or four weeks.

Q. But how long had it been milled before that to your own knowledge?

A. It would be on the road about a week or two.

Q. Yes, of how long it had been stored at the mill you have no knowledge? A. No.

Q. You don't know anything about the history of it be-

fore you received it?

A. Oh no, we did not get the history of it.

Q. Now in the bread that was made from it was the difference in color observable? A. Yes,

Q. That anybody could see that came along?

A. Well, no, not any person.

Q. Well, a person that had good eyes could see it, could

they? A. No.

Q. If a customer had been buying bread from you right along, and then on that day had bought some of this bread, would the customer have been able to notice the difference?

1. The chances are they would not.

- Q. It was so nearly alike that you think a customer would not have observed it?
- . A. Well, the customers didn't always observe the color of the bread.
- Q. No, but if the customer had been buying your bread right along, and on this day had bought some of this bread, was there anything about it that would have attracted the customer's attention? A. No.

Q. He would not have noticed it? A. I think not.

- Q. If the family had been buying your bread right along?
  A. Yes, sir.
- 820 Q. From your bakery and had bought some of this flour on that day you think they would not have noticed any difference at all?

A. You mean bought some bread?

Q. Yes, sir, bought some bread, yes sir?

A. I think when they would have been eating it they would have discerned that it was not quite as good to eat; there would have been an absence of the good flavor.

Q. All right. You think that the difference in the flavor was such that family that was eating it would have observed

it?

A. Well, you see the baker there is your fine judge, that only a man that is in the bread and cracker business that realizes the value of the little difference in flavor.

A. Yes. The flavor of the bread or the crackers makes the baker, if he gives the right flavor, take it yourself when you are eating at a hotel and you take a cracker that has a good flavor, you will take another and another.

Q. Yes.

A. But if that cracker does not have a good flavor why you would not say it was a better cracker.

Q. Yes.

A. But it would not have that, that would attract you, and the result would be that you would not eat a second one.

Q. Now lets come down to the ordinary family now that is buying bread of you from day to day, and have been right

along accustomed to use your bread from your bakery, if on the day in question they had purchased two loaves of this bread and taken it home, and had eaten it at the family table, do you think the difference was such that they would have observed that it was any ways different from the bread we got yesterday or the bread we got the day before?

A. Well, it is very doubtful.

Q. The difference was such that it took the trained taste and the trained nerve of the bakery man to detect it, was it?

A. That is right.

Q But you think you could detect it?

A Oh there is no thinking at all; I know that.

Q. And there is no thinking about what the ordinary family would do, you know that, don't you?

A. No, I don't know that.

Q. You don't know that? A. No.
Q. But your judgment was that the distinction there was so finely drawn that if [if] I had taken it home to my

family the chances are we would not have noticed?

A. Well, you would not have eaten much of it.

Q. Do you think I would have noticed the difference?

A. In the way that I described to you you would have known the difference.

Q. Well, then it would be that that bread did not give satisfaction in my family, wouldn't it?

A. You are right.

Q. And if it did not give satisfaction of course I would quit wouldn't I? A. You would.

Q. And that would react on the miller who furnished it,

wouldn't it? A. Yes, certainly it would.

Q. So if the miller was putting out flour then which did did not give any effect, he is the man that is going to suffer from it, isn't he?

A. What do I understand when the miller gives it the

bread didn't give any effect?

Q. Just as he gave it to you, that didn't give any effect, or didn't give satisfaction, I quit buying from you, you quit buying his flour, and he is the man that would suffer, isn't he?

A. Certainly,-well, he would not know it.

Q. Well he would suffer because you would not buy any more from him, is that right? A. Yes,

Q. So he is the one that would get it in the end?

A. I think he would; I think he deserves it.

Q. Yes, if he does it. A plan that don't give his customers satisfaction he is the one that suffers, isn't he?

A. Certainly.

Q. Now about two years ago you made some tests on crackers; where did you get that flour from?

A. From George T. Evans & Son, Indianapolis.

Q. They are brokers, are they, or millers?

A. No, sir, millers.

Q. Do you know where that wheat came from?
A. No. sir.

822 Q. Know nothing about that?

A. Supposed to come from Indiana.

Q. Oh I see. Is it winter wheat or spring wheat?

A. Winter wheat.

Q. Now I believe you said in giving the relative strength of these flours, I don't know as I took that down there; which one do you say has the greatest strength?

A. Why, the northern springs.

Q. And how is the color of the northern springs?

A. Well, it is darker generally.

Q. What is the next one in strength?

A. I should say Kansas or Nebraska.

Q. And what is the next?

A. Well, then, the soft winter wheats.

- Q. Soft winter. Now where do you get your soft winters?
- A. From Evansville, Indiana, or Flint, Michigan. Q. Now what grade of flour do you use mostly?

A. Patents.

Q. Well, I mean though with reference to these wheats?

A. The northern springs.

Q. Northern springs? A. Yes.

- Q. You use that mostly? A. Yes, sir. Q. And what do you use next after that?
- A. We use the George T. Evans & Son's or the Acme Milling Company now.

Q. And how is that as to strength?

A. Oh, it is a weaker flour.

Q. How as to color? A. This is a better color.

Q. Whiter? A. Whiter, yes.

Q. Why do you use that instead of the flour that is stronger?

A. We use it for a different purpose.

Q. Well, what is the purpose?

A. To make cakes and crackers; you can make crackers out of northern spring.

Q. Why not?

A. Because it is too strong; you have to work it too long to get the strength out of it.

Q. Well, in the selection of your flours do you make any difference in color? A. Oh yes, sir.

Q. What kind of a color of flour do you select?

A. Select a white rich color.

823 Q. Why do you select the white?

A. Well, because it is the better flour.

- Q. Trade demands it, does it, that is, the trade wants a white loaf of bread, does it?
  - A. Well, fairly white, not altogether white.

Q. Well. A. Not a dead white.

- Q. They prefer a white loaf of bread to the yellow loaf of bread, don't they?
- A. Comparatively, you see you must remember that there is a white loaf of bread and a yellow loaf of bread.

Q. Yes, sir.

- A. But the white loaf of bread with the nice rich yellow color going all through it is preferable to the dead white loaf of bread.
- Q. Yes, sir, but it is true, is it not, and you find it in your experience that the trade wants pretty white loaf of bread?
- A. Sometimes yes, excuse me now till I get that answer right.

Q. Yes.

- A. They don't want a dead white loaf of bread if the flavor is absent.
- Q. Oh no, but other things being equal if the flavor is present and the odor is present they prefer a white loaf of bread to a dark loaf of bread or yellow loaf of bread.

[-] You can not get a dead loaf of bread with a good

flavor.

Q. You don't answer my question. Assuming that the flavor is the same and the odor the same and the taste the same, then they prefer a white loaf of bread, don't they?

A. That is impossible.

- Q. No, now you don't answer my question, pardon me, for saying that I understood you said if the flavor was the same, and the color was the same, and the odor is the same, they prefer a white loaf of bread to the other, don't they? A. Yes.
- Q. You find that in your trade, don't you? A. Yes, sir. Q. And for that reason in purchasing the flour you aim to get, other things being equal, as nice and white a flour as you can don't you? A. Yes.

Q. And other things being equal, the white flour will make a bread which the public demands, better than a yellow flour,

won't it? A. Other things being equal.

824 Q. Yes, I am assuming that that was the case. Just one or two further questions, Mr. Taggart, can you tell me when it was you got this wheat from the Atchison, Kansas, mills? A. We haven't had any for over a year.

Q. Well, do you know from whom you got it?

A. Lukens Milling Company.

Q. Now do you know the grade of that?

A. It is their patent.
Q. Was it bleached?

A. I don't know that it was, but it was not satisfactory, so we quit buying it.

Q. Well, now, do you know whether the lack of satisfaction was due to the fact that it was or was not bleached, too?

A. No. sir.

Q. Did you make any tests of it? A. No, sir.

Q. Did you examine the bread made from it?

A. Yes, sir.

Q. Now what was the character of that?

A. Well, it was fairly good bread because it was mixed; you see we used all our flour mixed or nearly all.

Q. What do you mean you mixed it after you get it?

A. Yes, sir.

Q. Well, do you always do that? A. Nearly always, yes.

Q. Well, did you in this instance? A. Yes, sir.

Q. Well, now, do you mix these other flours that you have been testifying to? A. Yes, sir.

Q. That is when you got this unsatisfactory result from

bread you had been mixing the flours? A. We had.

Q. And when you got this unsatisfactory result as to the crackers you had been mixing? A. We had.

Q. Well, do you know whether all of that flour that you mixed together had been bleached or just a part of it?

A. A part of it.

Q. The other you don't know? A. The other was not.

Q. Now Evans there at Indianapolis did they run more than one mill? A. He did not then.

Q. They do now? A. Well.

Q. There was a consolidation there, was there?

A. There was a consolidation there.

Q. Now I believe you said a few months, or eighteen months, it was two years ago that you had the Evans flour?

A. Just about.

825 Q. With which you had the accident? A. Yes, sir.

Q. Now do you know whether Evans was bleaching then or not? A. He told me he was.

Q. Do you still buy Evans' flour? A. We do.

Q. Now do you know whether he is giving you bleached flour now or not? A. Well, I should say—

Q. Well, what is the fact?

A. He is not bleaching it what he sells us.

Q. What does he sell you now? A. His patent.

Q. What is it called?

A. I really forget the name now.

Q. Now don't you know that all the patent flour that Evans put out now is bleached? A. No, I do not.

Q. Well, can you give me the name of this flour, that you

are getting from him, do you know what he calls it?

A. McBeth.

- Q. Now do you know whether or not the McBeth flour made by Evans as he is putting it on the market now, do you know whether that is or is not bleached?
- A. If you will allow me to answer the question in this way, that what he grinds for us is not bleached, he gives me his word, and he is a young man of, I would say, very high character, and he tells me that the McBeth that he grinds for us is not bleached.
- Q. Well, do you know whether he makes a difference for the grinds for you and the McBeth that he grinds for other people? A. I don't know it, but he says he does.

Q. He says he makes a difference?

A. He says when we give him a order for 500 barrels, which we do at a time, he grinds it specially unbleached.

Q. He runs it specially for you? A. So he says.

Q. But the McBeth that we find on the market in Kansas-City, if we can find any, you don't know whether that would. be bleached or unbleached?

A. No, I know nothing about that. Q. Don't know about that? A. No.

Q. I wanted to keep track of that Kansas flour, and I guess he did, you said that you had from the Lukens Milling Company? A. Yes, sir.

826 Q. And you don't know whether that is bleached or not. You said it was not satisfactory?

A. I don't think it was bleached, but if it was, why, we only used a small portion of it any way.

Q. But whether the defect in it was [bout] the bleaching or not you don't know? A. No, we don't know that.

# Redirect Examination

By Mr. Butler:

Q. What was the name of the mill at Flint, Michigan?

A. The Dakota Milling Company.

- Q. And in Indianapolis the Evans is the Acme Milling Company?
- A. Well, it is now the Acme; it was then the George T. Evans & Son.
  - Q. And Jennison is the man in Minnesota at Appleton? A. W. J. Jennison.

John E. Mitchell Recalled as a witness on the part of libelant, being duly sworn, testified as follows:

### Direct Examination

By Mr. Butler:

Q. Mr. Mitchell, do you happen to know the mill referred to by Mr. Taggart, the last witness, at Indianapolis?

A. I know of them.

- Q. Do you know Mr. Evans? A. Yes, sir. Q. Do you know Mr. Evans? A. Yes, sir.
- Q. Is he a stockholder in your Company? A. No, sir.

Q. Is the Mill Company?

A. He is a stockholder in the American Company, Mr. Butler, the same as Mr. Ballard.

Q. What bleacher does he use in his mill?

A. The American.

Q. The American, the electrical process? A. Yes, sir.

Q. How long has he been using that?

A. Well, I couldn't tell, I don't remember.

827 Q. That is controlled by you or your concern?
A. It is now.

Q. And employs electricity, doesn't it?

A. Practically the same as the Alsop process, yes sir.

Q. The same medium is used?

A. Just a difference in the mechanism for making the flame, that is all.

Q. But the same old NO2 is employed, isn't it, that makes that air?

A. I would not know NO2, I am not a chemist.

By the Court:

Q. By that I suppose you mean you know nothing about

this chemical expression?

A. I will explain what I do, then I will satisfy Mr. Butler, I think, on that.

Mr. Smith: I think he ought to be permitted to do that.

Mr. Butler: Just wait a moment, Mr. Mitchell.

Q. Mr. Mitchell, I will ask you whether or not you do not know that nitrogen peroxide gas is used by the Alsop process and also by the American process, and also by the Williams process, and also by the Naylor & Gerard process?

A. I know that some of the best chemists in the country

tell me that the nitrogen-

Q. Wait a moment. I am not asking what the chemists know; we have them here?

A. Well, I couldn't tell, I can't analyze those gases.

By the Court:

Q. He is asking if you know that the nitrogen peroxide is a result of those things, processes?

A. Well, I would say, Your Honor, that I know as far as a man can know from what those chemists tell me, and I am perfectly satisfied that it does, I could not analyze the gas.

Q. You believe it does? A. I do, yes sir.

Q. And as the owner of the Alsop process you contend and claim that any one else who employs NO2 to bleach flour infringes that process? A. No, sir, I do not.

Mr. Smith: I object to that as wholly irrelevant in this case; we are not trying the nitrogen case.

828 The Court: Oh, I think that is right, it goes out.

Q. Now wait a moment, what did Jennison use up in Minnesota?

A. Why, we have a list there that we can-

Q. Well, if you could to refresh your memory?

A. I can not recall right now.

Q. Refresh your memory from your list?

A. Mr. Elliott, I think you have a list there, have you not? (Mr. Elliott hands list to witness). Where is he, Minnesota?

Q. Yes, at Appleton in Minnesota, W. B. Jennison & Company, or W. J. Jennison.

A. W. J. Jennison & Company, Appleton, Minnesota.

Q. Yes. A. They have the Alsop process.

Q. How long have they had that?

A. Well, this record does not show and I couldn't tell you that.

Q. As far as you know they never had another?

A. What do you mean?

Q. As far as you know or ever heard they never had any other than the Alsop? A. Not that I know of, no sir.

Q. Now how about this Mill in Flint, Michigan, called the Genessee Milling Company that Mr. Taggart got his flour from? A. Flint, Michigan?

Q. Genessee Milling Company I think is the name he gave?

A. I don't find any by that name.

By Mr. Butler: What was that, Mr. Taggart, did I misunderstand you?

Mr. Taggart: Genesee Mills, I think.

Q. Do you know the names of the gentlemen connected with it?

Mr. Taggart: No, I do not.

By Mr. Butler: (resuming)—

Q. Have you any mills at Flint, Michigan?

A. Flint is not even on the list-Yes, J. B. Burris & Son, Flint.

Q. What have they got?

A. They have got the Alsop process.

Q. You don't know whether that is the one. Do you know whether any other mill in Flint, Michigan or not?

A. That is the only one.

Q. That is all the list you have?

A. Well, this is the only list I have.

By Mr. Smith:

Q. What is the name of their mill if you know?

A. Which mill?

Q. The one there at Flint?

A. The only one I have on the list is J. P. Burris & Son, Flint, Michigan.

Q. You don't know what they call their mill?

A. No, I do not.

Q. That is the name of the Company?

A. That is the name of the party that purchased the license to use the process; I don't know the name of the mill.

By Mr. Butler:

Q. That was an Alsop process?

A. Yes, sir, all these are.

Victor Albrecht, called as a witness on the part of Libelant, being duly sworn, testified as follows:

# Direct Examination

By Mr. Butler:

Q. Where do you live, Mr. Albrecht?

A. St. Louis, Missouri.

Q. What is your business, Mr. Albrecht?

A. I am in the flour business, buying and selling flour in the City of St. Louis.

Q. How long have you been in that business?

A. Oh, for about 43 years.

A. Are you familiar with the different kinds of flour that comes to the market at St. Louis? A. I am.

Q. And what parts of the country send flour for marketing

at St. Louis?

A. Well, Missouri, Illinois, Kansas, Nebraska, some years Oklahoma, Minnesota, Dakota, once in a while Idaho, and Washington Territory sends a little, Colorado too, some years.

Q. Yes, and are you familiar with the various kinds of flour coming from the different states you have mentioned?

A. I am.

830 Q. What is a patent flour, Mr. Albrecht?

A. According to our standard in St. Louis—

Mr. Smith: I object to that as immaterial, irrelevant and incompetent.

A. We adopted a standard flour of soft winter wheat here in St. Louis in 1882, we call it patent, extra fancy, fancy and choice; we have no standards patents of anything else excepting soft red winter flours.

Judge Scarritt: I object to this as incompetent, irrelevant and immaterial and move that it be stricken out.

The Court: What was it he said, you will have to speak out, I didn't hear all.

Mr. Smith: I am objecting now. He is telling what we have done in the establishment of a standard at St. Louis, as incompetent, irrelevant and immaterial.

Mr. Butler: I don't care anything about formalities of establishing a standard. I think it is proper evidence to show what kind of flour is known in the markets of St. Louis.

Mr. Smith: That is not what he is proceeding to detail.

The Court: I don't see how that would be binding on anybody list of the standards fixed in St. Louis.

Mr. Butler: Any formal fixing of it, but I think what is known generally in the market any place in the country would be competent evidence as to whether or not this is a patent flour as known in the markets of the country.

The Court: Well, go on; I don't see how that can be binding in St. Louis.

To which ruling of the court claimant then and there duly excepted.

Q. I did not intend to ask, Mr. Albrecht, for any action of any organization or anything of that sort. What I am trying

to get at is this, whether or not you know the various 831 kinds of flour which are recognized generally in the flour market in commerce in St. Louis and this part of the country as patent flours? A. I do.

Q. Well, now, what is a patent flour as recognized in the market of flour commerce in this part of the country?

A. From 65 to 75 per cent the best part of the wheat.

Q. Of the best part of the wheat?

A. Of the wheat, yes, sir.

Q. And what do you mean, you say the best part of the wheat?

A. That is the middlings that they get out of the kernel of wheat and part of the break flour, that is separate, the balance they run into what they call extra fancy flours or low grades, some call it red dog, the lowest part of it.

Q. Now as to the percentage including again patents, does that differ with the different kinds of wheat, that is, a light percentage in case of the soft wheats of southern Missouri and the territory east of that along the Ohio River, from that in Kansas and Nebraska, in the winter wheat, hard wheat territory and the spring hard wheat territory further north?

A. Yes, sir, it does vary in percentage.

Q. Now give us the variation in percentage?

A. The soft wheat Missouri and Illinois wheat or Tennessee wheat or Indiana wheat, they generally get from 65 to 75 percent out as the patent.

Q. Yes, sir.

A. The hard wheats however, they can stretch that, make it from 70 to 80 per cent, that is both Minnesota, also Kansas.

Q. And how about Nebraska?

A. Well, that does not go quite so far as the Kansas.

[Q. And how about Nebraska?

A. Well, that does not go quite so far as the Kansas.].

Q. The flour seized in this case is said by the miller who testified—

Judge Scarritt: We object to commenting on what the miller testified if your Honor please.

Mr. Butler: I am not going to comment on it. I was just going to state what he said and ask the opinion of the witness on that assumption.

Judge Scarritt: We object to his statement as an improper direct examination.

The Court: Well, just a moment. We can not ask questions or we'will never get through in the world. I am not working by the day. My understanding is it is always right and allowable to put into the form of the question of an expert, assuming so and so and so and so.

Mr. Butler: That was my purpose in the question when interrupted.

Q. Assuming that the testimony was to the effect that the flour seized in this case is 90 per cent to the flour contents of the wheat at which it is milled is true in point of fact, that was made in Nebraska from turkey hard wheat in which, the testimony also states, that there was from 10 to 30 per cent yellow part; assume that to be true, then I ask you whether or not the flour in question is a fancy patent flour?

A. No, sir.

Judge Scarritt: I move to strike that out, if your Honor please, not the proper evidence in this case, because there is no no standard fixed as to what is a fancy patent flour.

The court overruled the objection, to which ruling of the court claimant then and there duly excepted.

Q. Are you familiar with bleached flour?

A. Somewhat, yes sir, had experience with it.

Q. What experience have you had with it?

A. A very sorrowful one.

Mr. Smith: I move to strike that out as wholly improper.

The Court: That is stricken out. He asked you what your experience is, didn't ask you for a declamation.

A. All right, I have had experience.

By Mr. Butler:

Q. Now you may tell us what the extent of your experience is with bleached flour?

A. In 1907, the latter part, well, it was the middle of July, we bought out the Eggers Milling Company, business at the city of St. Louis. They had a big stock of flour all in cotton sacks that is, that was sold in the city trade to the family trade. They told me—

Mr. Smith: I object to this as hearsay, incompetent, irrelevant and immaterial.

The Court: He asked what experience you had.

A. We bought the flour as a bleached flour, they sold it to us as a bleached flour, it was branded H. B. Eggers Milling Company "Good Luck" patent. We sold that flour in the city of St. Louis to I don't know how many different grocery men, may be a hundred or two hundred, and about six weeks after we began to get complaints.

Mr. Smith: I object to this as wholly incompetent, irrelevant and immaterial.

The court sustained the objection.

A. We received complaints from-

Mr. Smith: No, no, he sustained the objection.

By Mr. Butler (resuming)

Q. It is not proper to tell what others said to you about it. Did you yourself see the flour when you bought it?

A. I have, yes, sir.

Q. And how did it appear to be?

A. It appeared to be a soft wheat patent flour in the face; in the face it looked like a soft wheat patent flour.

Q. Yes. Now after you bought it and after you sold it, did you have occasion again to examine some of it?

A. Yes, sir, I took some of it home myself.

Q. Yes, from this very same flour?

A. The very same.

Q. How much was it you purchased?

A. I bought a patent flour.

Q. How much of it?

A. Oh may be 2400 or 2500 packages all the may from 8 pounds up to 98 pounds.

Q. Now you took home some of this flour that appeared

to be a soft wheat patent? A. Yes, sir.

Q. Did you use it?

A. That is we baked it, that is my wife did.

834 Q. Did you observe it worked in the bread and so forth? A. Yes, sir.

Q. You may describe that?

A. Well, the bread that we got out of that flour was a dark gray looking bread and if you took a bite or two you had all the bread that you wanted of that very same baking, and my wife and children—

Mr. Smith: I object to detailing what his wife and children said or did as immaterial, hearsay.

Q. Eat some of it?

A. They tried to, didn't eat much, though.
 Q. Well, by the way, how did that flour look?

A. It looked white like our standard.

Q. Now as to the color of the flour as compared with the color of a good patent flour?

A. Oh, it had a kind of a dead white color.

Q. Yes, now, the color of the bread was you say dark gray?

A. Dark gray.

Q. And how did the color of the bread compare with the color of bread made from an unbleached flour of the quality that this same looks?

A. The unbleached flour bread is entirely—is much better.

Counsel for claimant moved to strike that out as not responsive and the opinion of the witness.

The Court: He did not ask you that. It will be stricken out.

A. The color of the unbleached flour bread is creamier, that is white it has not got that dead gray color.

Q. Now as to which was the whiter, leaving out of consideration the element of creaminess, the bleached flour or the unbleached flour?

A. The unbleached is the whitest.

Q. Now have you from time to time observed other bleached flour? A. I have.

Q. In the market, to what extent.

A. Well, looked at them as they came along to be sold in St. Louis.

Q. Well, how frequently?

A. Oh, sometimes three or four times a week.

835 Q. And during what period of time?

A. Well, up till 1909.

Q. Now Mr. Albrecht in the absence of any bleaching at all, what effect if any, what force, if any, has the color of flour as [as] indicating the quality of the bleached?

A. You mean unbleached.

Q. Yes.

A. Well, you can distinguish the different grades very readily, if you take an unbleached patent or an unbleached 90 per cent flour, or an unbleached extra fancy, as some call it, clear, and the unbleached low grade of 1 to 5 per cent flour, you can distinguish the color very easily; it does not take much of an expert to tell that.

Q. Can you tell the grade of quality by the color?

A. We can, yes.

Q. What is the effect if the flours be bleached?

A. Then you are up against it.

Q. You mean you can or can not tell?

A. You can not tell.

Q. Now are you familiar with the effect of aging unbleached flour? A. Yes, sir.

Q. What is that effect upon color and quality?

A. You take a fresh flour and lay in the warehouse for 30 days you will find it a lighter color, in 40 days a little more, 60 days still a little more, up till about, well four or five months, then it stops from bleaching further.

Q. And how does that color so acquired in the storing compare with the color of bleaching made by bleaching?

A. Well, it always has a yellow creamy color, to it, whereas bleached flour has a dead color a different white.

Q. Now do you know whether or not flour that has been bleached improves in the same way you have described or told?

A. I do.

Q. Or does the- A. It does not improve.

Q. Does it change?

A. No, it stays just as the way it originally is, it is bleached.

### Cross-Examination

## By Mr. Smith:

Q. What is your business?

A. Flour merchant, buy and sell flour.

836 By Mr. Butler:

- Q. I want to inquire on another subject. Are you familiar with the color of flour made from the hard winter wheats? A. I am.
- Q. And not bleached, and of the turkey hard wheat of Nebraska. A. I am.
  - Q. And Kansas? A. I am.
  - Q. Winter hards and the spring hard wheats further north?
  - A. I am.
  - Q. Which makes the whiter flour of light grades?
  - A. The soft winter wheat flours are the whitest.
  - Q. And the next?
    - A. Next comes the Kansas dark hard wheat flour.
  - Q. And the next?
  - A. Comes the Minnesota and Dakotas.
- Q. Now as to the strength of the flour, do you know about that? A. I do.
  - Q. The baking strength, the strength of the dough?
  - A. I do.
  - Q. Which is the strongest?
  - A. The Minnesotas and Dakotas.
  - Q. And the next? A. The Kansas turkey hard.
  - Q. And the next?
  - A. Nebraska, and then the soft wheat.
- Q. The color, the flours having the lightest color, are the weakest in strength? A. Yes, sir.

## By Mr. Smith: (resuming)

- Q. You are a flour merchant? A. I am.
- Q. Have you been a miller? A. No, sir.
- Q. What was this business that you bought out there in St. Louis, what was that?
- A. It was the H. B. Eggers Mill Company's business, that is, they quit making flour in the city of St. Louis and I bought their flour.
  - Q. You didn't buy their mill? A. Oh no.
  - Q. Were they millers? A. They were.
  - Q. You did not go in the milling business? A. No, sir.
  - Q. This was a bankrupt stock of flour you were buying?
  - A. No, sir, it was not.
  - Q. How much did you buy?
- 837 A. About twenty-three or twenty-four hundred packages.
  - Q. By that you mean sacks?
  - A. Sacks for 8 pounds up to 98 pounds.
  - Q. I see, and when was that?
  - A. In 1907, in June or July, in July 1907.
  - Q. And they were going out of business?

A. They were, yes, sir.

Q. Was it sold at sheriff's sale? A. No, sir.

Q. You never did run a mill?

- A. I had charge of a mill at one time:
- Q. When was that? A. In 1889 and 1890.

Q. Where? A. Rolla, Missouri.

Q. How long? A. For about a year and a half.

Q. Did you bleach flour? A. No, sir.

Q. Now can you tell by examining patent flour the per cent?

A. Unbleached we can, yes.

Q. You can tell by an examination of patent flour the per cent of the actual flour that has been run into that patent?

A. About yes within 5 or 10 per cent.

Q. Can you? A. Yes, sir.

Q. Haven't any here now but [but] this afternoon I want you to tell this jury something about the per cent of some flours? A. All right, I will be here.

Q. Are there different kinds of patent flour?

A. Soft wheat is only one kind.

- Q. Well, but no different mills have a different per cent in patent? A. They have.
  - Q. Made from the same kind of wheat? A. Yes, sir.Q. Do you know of any two mills that make the same?

A. Not exactly, no.

Q. Well, does each miller regulate that to suit himself?

A. According to the class of wheat he grinds.

Q. I see, it depends somewhat on the miller, don't it?

A. Oh yes, sure.

Q. It depends somewhat on the equipment of his mill?

A. Certainly.

838 Q. And the kind of wheat he is grinding?

A. Certainly.

Q. Now in your trade do you have different brands of patent flour?

A. No, sir, we only have one kind of patent flour.

Q. Don't different mills make a different grade of patent flour.

A. All we know patent is a patent flour; we don't call it

high patent or low patent.

Q. In your experience haven't you learned that millers in putting out their flour will have one that they call a certain kind of patent and another, another kind of patent and so on? A. Oh yes, sir.

Q. Coming from the same mill? A. Yes, sir. Q. Now what does that mean in the trade?

A. Well, one means 50 per cent patent and another one 65 per cent patent, and another one 70 per cent, patent, some 80 per cent patent, some call their 90 per cent flour a patent.

- Q. Do they do that? A. Some of them, yes.
- [A.] In St. Louis? A. In St. Louis, no.
- Q. Where do they do that, in Nebraska?
- A. Kansas and Nebraska and Minnesota.
- Q. Any place else? A. Minnesota too.
- Q. Does Minnesota put out a 90 per cent patent?
- A. They call it such.
- Q. Do they? A. Yes, sir.
- Q. It goes on the market as such? A. Yes.
- Q. Do you ever handle any of them?
- A. I have. I sold it just what I bought it, 90 per cent patent flour.
  - Q. Do you sell that to your trade 90 per cent patent?
  - A. As a 90 per cent patent I sold it.
- Q. And you actually sold to your trade then 90 per cent patent flour? A. I sold them a 90 per cent patent.
  - Q. And where did that come from? A. From Minnesota.
- Q. Well, did you tell any of your trade that it was not a patent flour in fact?
  - A. I told them it was a 90 per cent patent.
- 839 Q. Well was it branded as such?
  - A. It was not branded at all.
  - Q. But you sold it as such did you? A. I did, yes.
  - Q. You sold it as a 90 per cent patent flour?
  - A. Yes, sir.
  - Q. And it was not branded patent at all? A. No, sir.
  - Q. Well, what made you call it 90 per cent patent?
  - A. Because the miller told me so.
- Q. And you passed it on to your trade as a 90 per cent patent? A. I did, yes sir.
  - Q. Now what other per cent of patents have you sold?
  - A. 65 per cent soft wheats.
  - Q. Any other? A. Oh yes, 70 per cent.
  - Q. Any other? A. 75 per cents.
  - Q. 80? A. Not soft wheats, no.Q. Hard? A. Yes, sir.
  - Q. 85? A. Yes.
  - Q. 90? A. Yes.
  - Q. Hard? A. Hard.
- Q. So you in your experience have handled patent flours and sold them to the market for first patent flours that was 75, 80 and 95 per cent?
- A. It is according to the way the miller sold to me; I sold to the trade again.
  - Q. You passed it on to the trade again? A. Yes.
- Q. And you never said to any of your trade it is not a patent flour?

A. I told them this is 85 or a 90 per cent patent or a 75 per cent patent.

Q. You always told them the per cent? A. I did, yes.

Q. How did you know the per cent?

A. From what they told me..

- Q. But it did not go on the market as a straight or a clear flour did it? A. No, sir.
  - Q. It went on the market as a patent flour?

A. It did, yes.

Q. Now were those sacks branded?

- A. What we sell to the bakers' trade we have no brand on them at all.
- Q. I am not asking what you sell to the bakers trade; 840 I am asking about this you sold as a 85 or a 90 per cent patent?

A. For the family trade we didn't sell any of those patents;

we sold 65 to 75 per cent soft winter wheat patent.

Q. The other you sell to the bakers? A. Yes, sir.

Q. Did they buy that? A. Of course they did.

Q. Is that the kind of flour that bakers in your town usually have? A. They buy all kinds of flour.

Q. The bakers then buy from 75 to 90 per cent, didn't they? A. They do.

2. And you sell it to them? A. We do, yes.

Q. Now you don't know of any standard that has been fixed by the State of Missouri showing what patent flour is, do you?

A. No, sir.

Q. There isn't any, is there? A. No, sir.

Q. You don't know of any standard fixed by the government or by any of its officers, or any of its representatives fixing the standard flour? A. No.

Q. But you do know in your experience you buy and sell a patent flour as high as 90 per cent haven't you?

A. Yes, sir.

Q. Now you don't consider anything wrong about that, do you? A. No. sir.

Q. Now this flour which you bought that was bleached, as you say, was that the only experience you had in the purchase and sale of bleached flour?

A. Up to that time, yes, sir.

Q. Up to that time. Now when you took this and baked it into bread the taste was exceedingly disagreeable, wasn't it?

A. It was.

Q. Very nauseating, wasn't it?

A. Well, it was so that you didn't want to eat any more of it.

Q. Yes, as you take it into your mouth you would spit it out, wouldn't you?

A. No, you swallow a little bit of it but you would not re-

peat the same dose.

Q. You would get up and leave the table?

A. No, keep sitting there and eat something else.

- 841 Q. What I want to get at now was the taste there was so offensive and so marked that anybody eating that bread could tell it?
  - A. Sure my children could tell and they did tell it too.

    Q. Could you tell by the looks of the bread? A. No, sir.

Q. What was the peculiar taste?

A. Oh, it was a kind of a rancid, didn't have that-

Q. Kind of taste like rancid butter?

A. Somewhat like it, yes.

Q. Now is that as well as you can describe it; is that as near a comparison as you can make?

A. Well, it didn't have that nutty flavor.

Q. But now it had the rancid taste like rancid butter?

A. Yes, sir.

Q. That is as near as you can describe it? A. Yes.

Q. And that was so painfully noticeable that anybody could tell that, could they? A. Yes, sir.

Q. Now that bleached flour was just about the same as any other bleached flour that you ever saw, ain't it? A. Yes.

Q. Did you ever have any bread made from any other bleached flour? A. No, sir.

Q. Is that the only bleached flour you ever tasted?

A. Yes, sir, because my wife would not have any more in the house.

Q. And you never tasted it any place?

A. No, not that I know of.

Q. Did you ever run across the taste in any other place where you ate bread? A. No, sir.

Q. Where do you stop here in town?

A. I am stopping over at the Baltimore.
 Q. Did you ever eat any bread over there? A. Sure.

Q. Did you ever eat any bread over there? A. Sure Q. Did you ever get that rancid taste over there?

A. No, sir.

Q. Is their bread over there all right?

A. Pretty fair, yes, pretty good.

Q. Fine? A. Not as good as we can bake it at home.

Q. No, I suppose not, there ain't any of these hotels get as good cooking as we get at home; what do you say about the bread at the Baltimore Hotel, do you say that is bleached or unbleached?

842 A. I couldn't tell about that.

Q. Can't tell by the taste of it whether it is or not?

A. It has not got that same flavor of bread that we bake at home.

Q. No, but it has not got that same flavor of this bleached flour that you had at home? A. No.

Q. Can you tell by the taste of it whether or not it is bleached flour? A. Well, to a certain extent.

Q. Well, this that you got at the Baltimore, what do you say about it? A. Oh, it is good bread.

Q. That is all right, is it? A. Yes.

- Q. You could not find any fault with that at all? A. No.
- Q. And from your ability to detect the taste of flours and taste of bread you would say that the bread served to you at the Baltimore Hotel is all right? A. Oh, yes.

Q. Now this flour which you bought from your party there

that you bought out, what was the name of it?

- A. "Good Luck" patent, H. B. Eggers Mill Company, Good Luck brand.
- Q. Had you ever handled that flour before in your business? A. No.
  - Q. You never had sold any of it to the different people?

A. No.

Q. So you don't know anything about what had been the experience of that flour on the market before, never heard anything of it?

A. Oh, it always used to have a run in St. Louis.

Q. As pretty good flour? A. Yes.Q. But you never sold any of it?

A. Not up to that time.

Q. Have you ever handled and do you now handle any Kansas flours? A. We do, yes.

Q. Where do you get it? A. Lyons, Kansas.

Q. What company? A. Lyons Milling Company.

Q. Lyons Milling Company of Kansas?

A. Lyons, Kansas.

Q. Who else in Kansas City?

A. Oh, I buy from the Kansas Mill and Export Company.

Q. Where are they located?

A. Well, they are right here in the city, they are flour brokers.

Q. Is that a mill? A. No, they are flour brokers,

- Q. Well, whose flour do you handle that come from Kansas besides this Lyons?
  - A. Well, the Mound Ridge Flour, Mound Ridge, Kansas.
  - Q. Where is that made? A. In Kansas.
  - Q. Whereabouts?
  - A. I don't know where the place is,

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Well, is this the name of the flour or the name of the A. It is the name of the place.

What is the name of the flour? Q.

We buy it unbranded, buy it as 90, 95 per cent. Kansas. A.

The what? A. Kansas flour. Q. How do you have it branded? Q.

- We call it Kansas; we put a tag on the sack when we A. deliver it to the baker.
  - Oh, this is baker's flour, is it. A. Yes. Q. Is it 95 per cent? A. I don't know. Q.

Do you sell it as such? Q.

We buy it for 90, 95 per cent flour. A.

Patent of 90 or 95 straight, or 90, or 95 per cent clear, Q. which is it? A. It is not the clear.

Is it straight? A. Straight, yes. Q.

Or is it patent? A. Yes. Q.

Well, now do you know whether that is bleached or Q. A. I do. not?

Is it? A. It is not bleached. Q.

Uubleached. And that is made at Mound Ridge, is it? Q.

Yes, sir. A.

Put up in sacks especially for you? Q.

No, in 40 pound sacks, that they put it in for our special A. purpose.

You don't buy direct from the mill but from a broker Q. A. Yes, sir. here?

Yes, sir. A.

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Now from Lyons, what is the name of that? Q.

They call it "Telegram" which we get in unbranded A. intes.

Q. In unbranded sacks? A. Sacks, yes.

Q. Why do you get it that way?

In unbranded jutes? A.

Q. Because we have to take back a great many of the empty sacks from the bakers and we can always get a little more money for the unbranded jutes than for the branded jutes.

Is that bleached or unbleached?

It is unbleached. A.

How do you know? Because I have tried it several times. A.

In what way have you tried it? Q.

Well, with this acid. A.

And it does not react? A. No, sir, does not show any. Q.

By the Griess test? A. Does not show any.

Does not show any? A. No. Q.

Now this flour that you purchased, how long had it been standing in the mill, do you know?

A. Which, the Good Luck, the Eggers mill?

Q. Yes, the Good Luck?

A. I don't know, may be three or four weeks.

Q. The company then went out of business, did they?

A. They did, yes.

Q. Who operated the mill after?

A. Nobody, they quit; they dismantled the mill.

Q. I guess that is all.

#### Redirect Examination

By Mr. Butler:

Q. Do you belong to any organization or associations of flour merchants?

A. I am a member of the Merchants Exchange, and I am one of the Flour Committee. The president of the exchange, he appoints seven men, flour men, millers and flour merchants to act as a committee on flour.

O. That is the Flour Exchange at St. Louis?

A. Yes, sir.

Q. And this committee has to do with what—the standards?

A. With standards, yes, sir.

Q. And qualities and grades? A. Yes, sir.

Mr. Smith: I want the witness to return after the noon recess for further cross-examination.

The Court: You may return here at the convening of court at 2 o'clock.

Arthur C. Comstock, recalled as a witness on the part of the libelant further testified:

# Direct Examination

By Mr. Butler:

Q. Mr. Comstock, you called my attention to some matter that you desire to correct and made in cross-examination?

A. Yes, in regard to the question that was asked that if all flour coming from our mill was labeled bleached.

Q. You mean patent, don't you?

A. Yes, was labeled patent. I did not so understand the question, and in looking over the transcript of the testimony I see that the answer is yes, to that question, and will say that that was an error on my part. This part of our flour that goes out in plain sacks with no marking or labeling whatever on it, and I wanted to be clear on this subject and make this correction, that is all.

Q. It is true, however, is it, as you answered to Mr. Smith that every kind of flour except the red dog or low grade, that is the patent and the clears and the straights then have gone

out in bags? A. They have.

Q. As you described?

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A. In time past, yes sir, but for the past, well this year, I can not recall any sale that has been made on these two lower grades of flour that have gone out in sacks that have been labeled patent.

Q. So the distinction you desire to make is simply this

that some goes out unbranded or unlabeled?

A. Yes, sir, I make it, again.

Q. In jute sacks? A. In jute and 98 cotton, yes, sir.

#### Cross-Examination

By Mr. Smith:

Q. Well, that would include patent flour as well as low grades some of your patent flour goes out without being labeled at all, is that right?

A. Well, no, there is none of our patent and straight and

clear.

Q. You don't say what it is? A. No, sir.

Q. But it is true that for years you labeled all three grades of your flour as a patent flour?

A. Some of it, yes, sir.

- Q. Some of it, yes, sir. A. A small per cent.
- Q. What you call your highest? A. High patent. Q. And the straight you call the straight patent?

A. Yes, sir.

Q. And so brand it? A. Yes, sir.

- Q. And your clears you labeled it clear patent and so branded it?
- A. In time past, yes, sir, there is some of it that went out in that way.

Q. How many years did that continue?

A. I can't recall any time that we have put out our clear in that form for the past two years.

Q. How many years did you before that?

A. Well, I don't know that, they were doing that at the time I went to this mill six years ago.

Q. And you continued it for four years any how?

A. Well, off and on, yes, sir.

- Q. This that went out unbranded was in jute sacks, was it?
   A. Part of it was in jute sacks and part of it in 98 cotton.
- Q. Well, what are these jute sacks, what are they intended for exportation?

A. That is the clear flour, yes, sir, and where the straight goes in jutes to bakers west in Utah.

Q. That which you intended for export you put in jute sacks and didn't say what it was, is that it?

A. No, sir, it was not labeled at all.

Q. It was not labeled at all? A. No, sir.

Q. And some of this which you sold to bakers you did not label at all? A. No, sir.

Q. But that which you intended for family trade and which went to the retail grocers was labeled either high patent or fancy, which was it?

A. It was the word "patent" on a part of it.

Q. It was on all of the sacks which went to the retail grocers? A. Well, no, I don't think it was on all the sacks.

Q. But it was on most of them, wasn't it?

A. No, it was on some of them.

Q. Even that which was patent to the clear patent that went to the grocers, didn't it?

A. I don't remember now just where it all went but there is some of it did, yes, sir.

At this point Court took a recess until 2 o'clock p. m.

Afternoon Session, Friday, June 10, 1910.

Pursuant to adjournment, court met at two o'clock p. m. Friday, June 10, 1910, and proceeded with the trial of said cause, further, as follows:

Victor Albrecht, being recalled was cross-examined by Mr. Smith, and testified further as follows:

- Q. Mr. Witness, in your experience in the flour trade, you have become reasonably familiar with the different grades of patent flour, that are sold, have you? A. Yes, sir.
- Q. Do you know anything about the "U. S. Standard" patent? A. I do.

Q. What per cent is that?

A. That is a sixty-five per cent.

Q. Where is it made? A. In East St. Louis.

Q. Do you know anything about the "Hiawatha" patent? A. "Hiawatha"?

Q. Yes, "Hiawatha".

A. I have handled same of that flour, some years ago.
Q. Where did it come from? A. Hiawatha, Kansas.

Q. What was it?

A. I bought it as a Kansas patent flour.

- Q. Well, do you know the per cent? A. No, I do not.
- Q. "Lexington Cream", do you know anything about that?

A. No, sir. Q. "Puritan"?

- A. No, sir, I don't know anything about that,
- Q. "White Rose", do you know anything about that?

A. No, sir.

Q. "Ermine" A. No, sir.

Q. Do you know any brands, that are sold on the market, as "Highest Patent"? A. As "Highest Patent".

Q. Yes. A. You mean, soft or hard?

Q. Both.

A. Yes, I know there is a Kansas hard wheat patent, that I have sold a few cars of, made here in Kansas City.

Q. Do you know what per cent patent it was?

A. They told me fifty per cent.

Q. Did you ever handle any flour made by the Bulte Milling Company, here in Kansas City?

A. Yes, sir. That is the very flour I have reference to.

Q. What is its patent? A. Fifty per cent.

Q. You have handled some of its flour, have you?

A. I have.

2. Bleached or unbleached? A. Unbleached.

Q. Now, when you purchased flour, you examined the flour by inspection—looking at it, and feeling of it, to determine the quality? A. I looked at it, compared it with another flour.

Q. You can tell, simply by the granulation, can you?

A. Yes, and by doughing them up.

Q. You can tell, by looking and feeling and doughing them up, whether it is a patent, and if so what per cent?

A. Pretty close.

Q. And whether it is bleached or unbleached?

- 849 A. Well, by comparing the bleached with unbleached, yes.
- Q. Well, suppose you don't know whether one of them is a bleached or unbleached, can you tell by the looks?

A. When they don't say anything about it?

Q. Yes. A. Not very well, no.

Q. If a traveling salesman came to you, and submitted a flour, and said "Here is the kind of flour I want to sell you", could you tell whether it was bleached or unbleached?

. Only by comparing it with a bleached flour, or another

unbleached.

Q. From the same or some other mill? A. Other mill.

Q. Other mill? A. Yes.

Q. But you can tell, by feeling it, whether it is a patent flour, and what per cent?

A. By comparing it with another flour.

Q. Now, I hand you three samples, here, that have been marked "Claimant's Exhibit 207", "206", and "209". I wish you would look at those.

1. I can't compare them, unless I have my samples to com-

pare by.

Q. Can't you look at those flours, and tell the jury whether or not they are patent, straight or clear?

A. Not here, no.

Q. And tell them what per cent it is? A. No, not here.
Q. Can you compare the flours with each other, and tell

them which is the best, and which is the poorest?

A. Not here, no.

Q. Can you tell me whether one is bleached, or unbleached, by looking at it? A. No, not here.

Q. Can you tell which is the superior flour, by looking at

them? A. No, not here.

Q. Can you look at those three samples, Defendant's Exhibit 206, 207, and 209, and tell the jury whether or not they are patent, or clear? A. Not here.

Q. Can you tell them whether they are straight, or clear?

A. Not here.

Q. Can'you tell whether either of them is a patent flour?

A. No, not here.

Q. Can you tell whether either of them is a bleached flour?

850 A. Not here.

Q. Where could you? A. In St. Louis.

Q. Well, unfortunately, we can't take them down there.

Mr. Smith: I guess that is all.

### Redirect Examination

By Mr. Butler:

Q. How would you do that in St. Louis? Describe that to us.

A. We have a room there, where we are accustomed to our light, and we have other flours, that we use as a guide, and we compare [then] with the samples that are mailed to us. We are accustomed to that light, better than any other light. I am not used to this light here.

Q. Does that involve doughing them up, too?

A. Well, not exactly. It does, to a measure, yes, because it gives me the color of the flour.

Q. Have you any tests for bleached flour? A. Yes, sir. Q. What is that? A. We use this here dropper—this acid.

Q. The Griess test, they call it? A. Which?

Q. The Griess-Illsvoy test? A. Yes, this government-

Q. (interrupting) How do you use that?

A. We just drop it—take the flours, bleached and unbleached, and smooth them down, put them together, and drop these drops on them.

Q. What colors are the drops?

A. The bleached will always come out pink.

- Q. What is the color of the drops you put on the flour?
- A. It is a white.

Q. White, or clear?

A. It is a clear color-very clear.

Q. And it turns pink on bleached? A. Yes, sir.

Q. How does it turn on unbleached?

A. It has no effect whatsoever.

Q. Have you doughed up many specimens of bleached flour?

A. I have.

Q. How does that dough up?

A. They dough up kind of short. They haven't got the strength, as the unbleached flour has.

### Recross Examination

By Mr. Smith:

- Q. Can you dough these up, and tell us whether they are bleached or not?
  - A. No, sir, I can't here, I told you before.
    O. You could in St. Louis? A. Yes, sir.
- Q. This flour that you bought from this W. J. Jennison Company, going out of business,—how many years had they been running? A. In St. Louis?

Q. Yes.

A. Oh, they were running there, I guess, some twenty odd years, or more.

Q. And this you bought was the tailings, or clean-up, at

the end of a twenty-year run?

A. No, sir. It was not the tailings or clean-up. It was a regular run of flour they had made for the regular city business, for their regular trade.

Q. It was the last they had made in the mill?

A. It was the last they had made. They made it for the city trade.

Q. When you got these sacks out of there, there wasn't any more flour left in the mill?

A. Yes. They had some flour in there in jute sacks, left.
Q. They had some in jute sacks? They didn't have any

flour except what was left in jute sacks?

A. They had some in jute sacks, some in barrels, and some in half barrels.

Q. But you bought all that was in there, branded, didn't you? A. I bought the "Good Luck" patent.

Q. Now, the 'Good Luck" had been sold in St. Louis for many years? A. Since about 1882.

Q. It was a big flour, there?

A. Yes, sir, they had a big run. Big reputation. Q. One of the best flours in St. Louis, wasn't it?

A. Yes, sir, it was at one time.

- Q. And had been up to that time, had it not?
  A. No, they were having trouble before.
- 852 Q. How long before?

A. Oh, for quite a little while.

- Q. How long? A. Oh, for about a year.
- Q. About a year? A. Yes, sir.

#### Redirect Examination

By Mr. Butler:

Q. Were they bleaching during that year? A. Yes, sir.

Is that "Good Luck" patent still sold in the market in St. Louis? A. Yes, sir.

Do you still sell it? A. We are, yes, sir. Q.

Q. This particular mill was dismantled, and pulled down?

Yes. A.

Q. But they moved out to another place?

A. They have a mill at Harmon, Missouri, also, Q. Still making the same brand? A. Yes, sir.

Q. Are they bleaching it? A. No, sir.

Q. What kind of flour is it, now?

A. It is all right. Have no trouble with it. It has given satisfaction wherever it goes.

Q. One of the best quality flours, and one of the best flours in the market down there? A. Yes, sir.

So, as I get the idea, this "Good Luck," patent, was one of the best known and satisfactory flours in St. Louis, before they commenced bleaching it? A. Yes, sir.

Q. And they have stopped bleaching? A. Yes, sir. Q. And you got some while they were bleaching?

A. Yes, sir.

[A]. And you have told us about that? A. Yes, sir.

## Recross Examination

By Mr. Smith:

Q. How long did they bleach? A. How long did they bleach?

0. Yes, how many years did they bleach "Good Luck" flour?

How many years? To my best knowledge, about two or A. three years.

853 Q. Well, do you know anything about that? Only from what they have told me.

Don't you know they bleached it for more than five Q. vears?

A. No. I don't know.

Witness excused.

Dr. John Marshall, called as a witness on behalf of the government, being first duly sworn, was examined, and testfied as follows:

## Direct Examination

By Mr. Butler:

Q. Your name is Marshall? A. John Marshall.

Q. Where do you reside? A. Philadelphia.

Q. And your occupation, Doctor?

A. Professor of Chemistry in the University of Pennsylvania.

Q. What particular kind of chemistry,—generally?
 A. Teach general chemistry, and physiological chemistry.

A. Teach general chemistry, and physiological chemistry.
Q. What has been your professional education, experience, and special work, if any? I would like to have you state your

qualifications, quite fully.

A. I received my academic and scientific education at Pennsylvania College, at Gettysburg, Pennsylvania. I studied medicine at the University of Pennsylvania, and was graduated as Doctor of Medicine in the University of Pennsylvania, and, subsequently, studied physiological chemistry at the University of Tuebingen, Germany, and was graduated there with the degree of Doctor of Natural Science. I have been teaching chemistry in the Medical School of the University of Pennsylvania for the past thirty years.

Q. Now, how old is the College of Medicine in that Uni-

versity?

A. It was established, I think, in 1740. It was the first medical school that was established in the United States.

Q. And as to its size, compared with the other leading

medical colleges?

A. Oh, I should say that it compares favorably with the other medical schools of like rank, in the United States.

Q. And you have taught in that college for how long?

A. About thirty years.

Q. Have you had to do with the teaching of toxicology, and the study of it? A. Yes.

Q. You have pursued original investigations, during that

time, too? A. Yes.

2. Along the lines of your profession? A. Yes.

Q. Have you, or have you not, made any special study of the subject of bleached flour, or the bleaching of flour by nitrogen peroxide?

A. I have made no special study.

Q. Made no examinations or analyses? A. No.

Q. And you have not become familiar with the process here complained of—the Alsop process—for bleaching flour?

A. Except in a general way.

Q. So that the answers you give in this case will be based upon your general learning and knowledge of the substances referred to in the assumption of facts upon which your opinions rest, as I understand it? A. Yes.

Q. Now, it appears-at least there is evidence in this

case supporting these facts:-

Mr. Scarritt: (Interrupting) I object to a statement of that kind, if Your Honor please, as wholly incompetent.

The Court: You may proceed.

Mr. Scarritt: Save an exception.

By Mr. Butler:

Q. (Continuing) There is evidence in this case, tending to support these facts—

Mr. Scarritt: (Interrupting) Same objection.

855 By Mr. Butler:

Q. (Continuing) Namely, that the flour that was seized in this case was subjected to a treatment by a process known as the Alsop process, which consists in the production of nitrogen peroxide gas, which was mixed with atmosphere, was brought into contact with the flour, while it was in a state of agitation, and the flour was thereby treated, so that it was bleached or whitened to some extent, at least. I ask you whether or not in your opinion that process added to or imparted to that flour, so treated, any substance or substances.

Mr. Scarritt: Same objection.

The Court: Overruled.

Mr. Scarritt: Excepted to.

A. Yes.

By Mr. Butler:

Q. What substance, or substances?
A. Nitric acid, and nitrogen peroxide.

Q. What is the character of nitrogen peroxide?

A. Nitrogen peroxide is a gaseous substance. Brownish red, in color, very irritative to the mucus membrane, and a poisonous substance.

Q. What is nitric acid?

A. Nitric acid is a liquid, which may be volatized, and is an exceedingly irritative, corrosive substance, and is a poisonous substance.

Q. Assuming that the bread made from flour containing such substances, also contained nitrite reacting material. I will ask you whether or not there is imparted to the bread any added substance, A. Yes.

Q. And the character of it, as to whether it is poisonous or not?

A. Poisonous, in character.

Q. Now, I would like to have you explain to the jury the effect,—chemical, or physical, or whatever it may be,—upon a person, of such substance taken with the bread.

A. The principal effect would be the action of the nitrite 856 contained in the bread, upon the red coloring matter of the red corpuscles of the blood, changing or converting the hemoglobin of the blood into a substance known as methemoglobin. This substance is a foreign body in the blood circu-It has, in combination, oxygen with the hemoglobin molecule, which is so firmly fixed in combination with the hemoglobin, that the vital processes of the animal body are not sufficiently strong to separate the oxygen from the hemoglobin, and consequently the substance met-hemoglobin circulates in the blood stream, as a foreign body, not a carrier of oxygen, until finally it is destroyed by the liver, or, if the quantity produced be beyond that which the liver is able to destroy. that excess quantity may appear in the urine of the individual. It removes from the blood circulation a certain, varying quantity of hemoglobin, which no longer may functionate as a carrier of oxygen to the tissues, to oxidize various substances, necessary to sustain life. Extra strain is, therefore, placed upon the liver, to remove this met-hemoglobin; and extra strain in the case of adults, is placed upon the red bone marrow, the production of corpuscles and hemoglobin, the oxgven-carrying material, to replace that which has been rendered inert by the action of nitrite, by having been converted into met-hemoglobin.

Q. And what effect, if any, upon health?

A. It would be injurious to health.

Q. I would like to have you explain a little more fully the office of the hemoglobin of the blood, and how it performs its function, and the effect of changing that—immediate and direct effect of changing that hemoglobin to the met-hemoglobin

that you have spoken of.

A. In the blood stream there are red corpuscles, invisible to the naked eye, which contain a red coloring substance, which is known as hemoglobin, when it is not combined and, when it is combined with oxygen, to form a dissociable compound, oxyhemoglobin. In respiration, the hemoglobin contained in the red corpuscles of the venous blood, is brought into the lungs, where, they having an affinity for the oxygen, which is one of the gaseous constituents of the air, the hemoglobin com-

857 bines with the oxygen to form oxyhemoglobin. This oxyhemoglobin contained in the red blood corpuscles is then conveyed, through the arterial system, to the various parts of the body, and, at the terminals of the arterial system—circulatory system, the blood corpuscles, passing through a mass of tissue in which vessels are indistinguishable by means of the microscope, and, in passing through this mass of tissue, to reach the terminal of the venous system, the oxyhemoglobin gives up its oxygen, to oxidize the tissues, or materials that may be in solution there, to form carbon dioxide, and to form water, and this oxyhemoglobin is thereby reduced to the condition of the hemoglobin, which is returned by the venous

system to the lungs, to be again oxygenated. That is where the hemoglobin will again combine with oxygen to form oxyhemoglobin and, thus, the hemoglobin serves as a carrier of oxygen—that is, the oxyhemoglobin serves as a carrier of oxygen, and a given quantity of hemoglobin may serve to carry a given quantity of oxygen to the system. Now, however, if any of this hemoglobin is converted into met-hemoglobin. which is a compound of oxygen with hemoglobin, in which the oxygen is more firmly combined than in the case of oxyhemoglobin, and, although, the quantity of oxygen is the same, in oxyhemoglobin as in met-hemoglobin, the oxygen in met-hemoglobin is so firmly attached—combined with the hemoglobin that the vital processes are not sufficiently strong to separate the oxygen from the hemoglobin, nor to use the oxygen to oxidize the tissue and tissue material, to sustain life, and, consequently, it passes through the circulation to the arterial system and the venous system, and continues this cycle until, finally, it is destroyed by the liver. Therefore, a certain quantity of the hemoglobin is rendered inefficient. It no longer functionates as a carrier of oxygen to the system, serves, or acts as a foreign body in the blood circulation, and, therefore, must be removed. As I have said before, it places an extra strain upon the liver, in order to remove this, and it

places an extra strain upon the red blood marrow, in adults, to regenerate the corpuscles, and also the hemoglobin, which they contain, to replace the corpuscles of the hemoglobin that has been rendered inactive by the action of nitrite, and the formation of met-hemoglobin.

Q. And is it your opinion that the nitrite in this flour, and bread made from it, will work that change upon the hemo-

globin? A. Yes.

Q. And make it met-hemoglobin? A. Yes.

Q. With the resulting destruction of function? A. Yes.

Q. What is the extent of such action, or change, upon the blood, in relation to quantity of the nitrite reacting material contained—that is, does it vary, with the quantity taken?

A. Undoubtedly varies with the quantity.

Q. If sufficient be taken, may poisonous results, to the extent of great illness, or death, be produced? A. Yes.

Q. Now, if the quantities taken be very small and minute, will there be any such action as you have described, in the change of the hemoglobin to the met-hemoglobin? A. Yes.

Q. Now, is there any difference in the kind of action which takes place, or not between a deadly dose, and a very minute taking, such as would be taken with bread, or, is the difference only one of degree? A. One of degree.

Q. The same kind of action, without regard to quantity?

A. Yes.

Q. Now, the tendency of that action, as respects the health of a consumer of bread—a regular consumer of bread, made from flour so treated. What is the tendency, as respects health, or well-being? A. It would have an injurious effect.

Q. And, the degree of injury that would result, depends

upon what?

A. Depends upon the quantity of nitrite present in the bread.

Q. Now, may health be impaired by the taking of such nitrite in bread, without the appearance of any observable symptom of impairment of well-being, following the tak-

859 ing of such bread?

A. If the quantity of nitrite administered or ingested be very small, it may not be observable by the instruments

which are employed for making such diagnoses.

Q. Assuming that the bread be regularly consumed—bread containing these nitrites, may substantial injury come to health, without being able to observe any particular symptom, after any given taking of the nitrites? A. Yes?

Q. Would, or would not the system acquire a tolerance, or toleration, and adjust itself to minute quantities of nitrites added to the flour by bleaching, so that it might be said it would not produce any of the injurious effects in the blood, at

all, which you have described?

A. So far as the blood is concerned, the chemical action would occur, whether the quantity of material were large or small, without any reference to tolerance.

Q. The action would continue?

A. The action would continue as long as the nitrite was

being consumed by the individual.

Q. It has been suggested that nitrites are sometimes found in the saliva in the mouth, of human beings, perhaps frequently, or generally. Assume that to be a fact, I would like to have your opinion, whether or not that fact would change your views as to the injuriousness of nitrites added to bread through bleaching of flour. A. No.

Q. Why?

A. Because nitrites, from whatever source, would have the same action upon the blood, and nitrous acid—nitrites are not hormal to normal saliva, although adults, particularly, have in their saliva nitrites, resulting largely from bacterial action in the mouth.

Q. Would the nitrite formed in the saliva, or existing in

the saliva, be injurious? A. Yes.

Q. What is your opinion as to whether or not nitrites are, as a matter of fact, secreted normally in normal saliva?

A. My opinion is that normal saliva does not contain nit-

Q. Then, how does it happen that nitrites are found in the saliva of the mouth?

A. Because of bacterial action in the mouth.

2. Do the salivary glands decrease nitrates, sometimes?

A. If nitrates have been ingested, those nitrates may be given off by the saliva, and these may be reduced, in the mouth, by bacteria, to the condition of nitrites.

Q. You say nitrates may be secreted in the saliva, after having been taken into the stomach, with food or otherwise?

A. Yes.

Q. And that the nitrates so secreted by the saliva may be changed in the mouth, by bacterial action, to nitrites?

A. Yes.

Q. And is it your opinion that that is one of the sources at least, of the nitrites which are found in saliva?

A. Yes.

Q. I would like to have your opinion, whether or not nitrates would be formed in the flour, as a result of bleaching.

A. I believe that nitrates would be produced, or nitro com-

pounds.

Q. Now may nitrates, taken with food, in flour or bread, be changed by bacterial action, during the progress of digestion?

A. Yes. Q. How?

A. Changed by the action of certain bacteria in the intestines, into nitrites, reduced by the action of bacteria from nitrates to nitrites.

Q. And, the effect upon the system, of nitrites to produced?
A. Would be the same as from nitrites produced from any

other source.

Q. Are nitrites, in your opinion, normal constituents of healthy, and sound vegetable articles of food?

A. Nitrites?

Q. Nitrites. A. No.

Q. Or meats, free from any stage of decomposition?

A. No.

Q. If nitrites are found in vegetables, or meats, what, in your opinion, is the source of such nitrites?

A. The reduction of nitrates to the condition of nitrites.

Q. In what process?

A. By putrefactive processes. That is, by bacterial action, reducing these from nitrates to nitrites.

861 Q. That is, decomposition? A. Yes, sfr. Q. Action in the nature of decomposition?

A. Yes, sir, in the nature of decomposition—bacterial action. There may also be present, in meats, for example, sub-

stances at present unknown—that is, not isolated, undetermined, that might have an action also, upon nitrates, reducing the nitrates to nitrites.

Q. Other than the effect of decomposition? A. Yes.

Q. But, in any event, you think that the nitrite is not normal to the sound and healthy meat? A. No.

Q. But, as the result of change from nitrate to nitrite?

A. Yes.

Q. Now, it has been suggested, during this trial, that cured meat, bacon, and ham, I think—sometimes contains nitrites. Have you any knowledge upon that subject, or opinion, as to

whether that is true, in point of fact?

A. In the curing of ham saltpetre,—potassium-nitrate,—is employed, and that would be a sort of nitrites by reduction of the nitrate to the nitrite, and furthermore in the process of smoking of the meat, we would have nitrites produced—salt meat.

Q. Now, as to the fect of such nitrites, when taken into the system. Is this the same as the nitrite contained—

A. (interrupting) Same as nitrites derived from any other

source.

Q. It appears that, if flour be subjected for a relatively long time to the bleaching medium employed by the Alsop process, that it will turn yellow,—some of the witnesses describing it as orange color, some, I think, as lemon, and some as yellow. What produces that, Doctor?

A. The action of nitric acid upon the gluten of the flour, with the production of a nitro compound, called xanthroprotein

-an orange-yellow substance.

Q. Now, I want to get at the character of that substance—that yellow-orange substance, xanthroprotein, as to whether or not it is poisonous? A. When ingested?

Q. Yes-taken as food, I mean.

A. Yes, I should say.

Q. Now as to the use of such flour. What would its effect

be upon health?

A. The same effect that one would observe by the action of nitrites, because this substance contains NO2 groups, and, when the material is digested, the formation of nitro-albumose, and nitro-peptone. These substances break up with the reduction of nitrites, and, therefore, you would have action upon the hemoglobin, that produces the met-hemoglobin.

Q. I will ask you to give us your opinion as to the relation of the amount of poisonous material in flour, bleached simply long enough to whiten it, with that so treated as to

produce the xanthroprotein.

A. The flour bleached merely to whiten it, would contain a less quantity of nitrite material, than the flour bleached until

it had become yellow, and, therefore, in the case of the flour that had not bleached only to whiteness, the action of the nitrite would be less, because of the lesser quantity of nitrite material in the flour, whereas, in the case of flour that was bleached to yellowness, the quantity of nitrite material would be, or nitro material, would be larger, consequently the action would be greater than in the case of the flour bleached merely to whiteness.

Q. It would be the same poison, but differing in amount?

A. Yes.

Q. Now, Doctor, referring to this specific flour that has been seized in this case, you may assume that it contains nitrites, or nitrite reacting material, which, calculated as nitrite of sodium would yield, in a forty-eight-pound sack of flour, four grains, and you may further assume that there will remain in the bread made from that flour, one-fourth to one-fifth of such nitrite reacting material, so, on the basis of seventy loaves to a sack of flour, would yield, nitrites, computed as nitrite of sodium, one seventieth to one one-hundredth of a

grain, per loaf. I will ask you whether or not in your opinion the consumption of such flour, or bread, would be injurious to health, assuming it to be consumed regularly in such quantities as bread is, usually consumed.

A. Yes.

- Q. Now if the quantity that I have given you be substantially reduced, or, indeed, reduced so that the quantity be taken to be relatively minute. I will ask you if that would alter your opinion as to the kind of effect the consumption of that bread would have.
  - A. No. Except that the action would be less in degree.
     Q. Less in degree, but the same in kind? A. Yes.

(Recess taken for five minutes)

## Cross-Examination

By Mr. Smith:

Q. Doctor, you, in answer to a question by Mr. Butler, I believe, stated that the process that was described by him would, in your judgment, impart to the flour nitrogen peroxide. Am I right? A. Yes.

Q. You never examined any of this flour treated by that process, to determine whether or not nitrogen peroxide was

present in the flour, did you? A. No.

Q. If it is not in the flour, then the conclusions to which you testified would have no foundation, would they?

A. In respect to nitrogen peroxide?

Q. Yes, sir. Your conclusion as to the condition of this flour is based upon the assumption that it contains nitrogen peroxide, is it? A. Not wholly.

Q. Upon what do you base it?

A. Compounds that are produced by the action of nitric acid.

Q. If this flour does not contain nitric acid, then what?

A. Then assuming that it does not contain nitric acid, or nitro compounds, or nitrites, or nitrogen peroxide, of course the flour would not be injurious.

864 Q. Of course, if the flour doesn't contain something, it

is all right, is it? A. Yes, sir.

Q. Now the substance that is referred to in this case, as nitrites, or as nitrogen peroxide, or as nitrite reacting material,—do you use those terms interchangeably?

A. Yes. Nitrite reacting material.

- Q. So, in this investigation, it will be all right, then, to refer to it as nitrites? A. Nitrogen, or nitrogen peroxide.
- Q. Those are different terms, meaning the same horrible thing? That is right, isn't it? A. Yes.
  - Q. Now, you never examined any of this flour? A. No.
- Q. And of course you don't know whether there is any there or how much is there? A. No.
- Q. But you have merely given your testimony, based upon your general knowledge of chemistry, and the results of chemical action? A. Yes.
- Q. Now, isn't it true, Doctor, that there may be a great many chemicals, which, if taken in sufficient quantity, will produce injurious effects, which, if taken in minute quantity, or gradually, instead of producing harmful effects, are, in fact, beneficial?
- A. There are substances which may be taken in minute quantities, which will not yield observable effects—general observable effects—effects that can be measured and determined.
- Q. Yes, but do you, as a physician and a chemist, know that they will either have a negative or a beneficial effect?

A. I am not a physician.

Q. But, what would you say, as a chemist? Wouldn't the

effect be either negative, or beneficial?

A. If a large quantity of a material that is injurious be taken, then, we would observe effects—that is, visible appearance of the effects. The effects may be measured by the instruments that are available to the physician or to the physiologist.

Q. Well, let us take a concrete case. Nicotine, if taken in sufficient quantities, would be fatal, wouldn't

it? A. Yes.

Q. Now, how much nicotine would I have to take into my system to have a fatal effect?

A. That would depend upon whether or not you are accustomed to taking nicotine.

Q. Well assume that I am an ordinary smoker, how much nicotine would I have to take into my system, to kill me?

A. A very small amount.

Q. It would be a very small quantity?

A. I am not able to say the exact amount. Q.

Less than a grain? A. Oh, yes.

- Q. Less than a grain of it? If I took less than a grain of it, it would kill me? A. Yes.
  - And yet, if I smoke a cigar, it doesn't harm me, does it? A. Oh, you are taking much less than a grain. You are
- taking a very small amount. When I smoke a cigar, I am taking a very small quantity? A. Notwithstanding, it is having its effect.

Q. Injuriously? A. Yes.

You don't indorse that theory, do you? A. I do. O.

Do you think that all of us, when we smoke a cigar, that

we are having injurious effects? A. Yes.

Q. Would you, as a witness, be willing to say that, as a chemist, you believe that the taking of a small amount of nicotine into our systems, as we do when we smoke a cigar, would have an injurious effect? A. Yes,

Q. Now, pardon me,-without being personal-you did that, during the recess, didn't you?

A. Yes, I am an habitual smoker.

Now, you don't believe, do you, that you have shortened your life, do you, or impaired your health?

A. I am inclined to believe that I have.

Q. You are not very certain of this, are you? You don't have any moral compunctions because of the use of it, do you? Well one will persist in pleasures that are dangerous.

Q. Yes, I guess that is true, and that is one of the 866 pleasures in which you think the enjoyment overcomes

the deleterious effects, is it? Well, may it not be that eating white bread, is a pleasure which may overcome the deleterious effects of nitrites that may be in it, as well as smoking a cigar overcoming the effects of the nicotine?

A. It is a question in my mind whether I prefer a white bread, that has been treated with a bleaching material, or a bread that has not been bleached. I think that I, even from the physical appearance of the bread, choose the bread that

is unbleached.

Q. Well, that is a matter of taste, as it is a matter of taste about smoking, isn't it? A. Largely.

Now, what would be a fatal dose of nitrites, if I took

it in the form of sodium nitrite?

That would largely depend upon the individual-possibly ten or twelve grains.

Well, let us assume we have just an ordinary individual, average size, average health, and average condition, as the most of us are, here. How much would be a fatal dose of nitrites, taken in the form of sodium nitrite?

A. It might be more than ten or twelve grains.

Q. It might be less?

A. Possibly might be less, depending upon the individual.

Q. Well, now, let us assume that a man of ordinary health, average age, such as this jury, or myself, or yourself,—suppose that we took into our systems, in the form of sodium nitrite, during a period of ten hours eight grains of sodium nitrite.

Mr. Scarritt: Nitrite?

By Mr. Smith:

Q. (Continuing) Nitrite. What would be the effect?

A. I think it would be an injurious effect.

Q. It would kill him? A. Might.

Q. That is your judgment, that it would kill him?

A. It might. I will not say it would.

Q. Well, of course, it might. If I swallow 'most anything it might kill me, but I want to know whether or not, in your judgment, as a chemist, it would kill him.

A. It might. I don't know.

- 867 Q. Is that the most definite answer you can give to it? A. Yes.
- Q. Suppose that I take, concentrated into a few doses, which I would take during a period of ten hours, all of the nitrites that would be contained in bleached flour making the bread that I would eat for a period of seven years, and I could take that, concentrated, so that I could take it into my stomach in the form of sodium nitrite, in ten hours, what would you say would be the effect on me? A. Injurious.

Q. To what extent?

A. Not to the production of death.

Q. To what extent would it be noticeable?

A. It might not be visibly noticeable, but, notwithstanding, it would have its chemical effect.

Q. What is a medicinal dose of nitrites?

A. Oh, from one grain up to two or maybe three grains.

Q. All right. Let me increase it to nine. I will take nine times a medicinal dose, and I will take it all in a period of ten hours, in the form of sodium nitrite. Would the effects be observable?

A. It is quite possible that the effects would be observable.

Q. In what way would they be observable?

A. You would have lowering of the blood pressure.

Q. What other forms?

A. Might have irritation of the stomach.

Q. What other forms?

A. You might have influence upon the nervous system.

Q. Anything else?

A. That is all, except, of course, the action upon the

hemoglobin in the blood.

Q. Yes? We will come to that, pretty soon. If it were shown that, during a period of ten hours, an individual did take nine grains of nitrite, in the form of sodium nitrite, without any effect at all, observable, what would you say then, was the result, or the injurious effects of nitrites?

868 A. I would say it would injuriously affect the hemoglobin of the blood, but, possibly not a visible effect upon the blood pressure; or, upon the stomach, or upon the nervous system.

Q. Suppose he took twenty grains into his stomach, in a period of twelve hours, what would be the result?

A. In the case of twenty grains?

Q. Yes, sir.

A. I should say that, in the case of twenty grains, distributed over ten hours?

Q. Ten hours, yes.

- A. That you would have a decrease in the blood pressure, that would be observable.
- Q. Would the patient feel it? Would the patient know that he was affected in any way?

A. I think the patient would be uncomfortable.

Q. Well, pray tell me, how many grains he would have to take, in ten hours, to kill him.

A. I don't know. I imagine if he were to take twenty

grains, at one dose, that it probably might kill him.

Q. Well, according to the testimony here, if I may refer to it, as Brother Butler did, in order to get twenty grains into him, a man would have to take all the nitrites contained in the flour that he would eat, in a period of about fifteen years. Now, you think, if he could concentrate that all into one dose, and take it in one dose, you think possibly it might kill him, but you are not sure of that, are you? A. No.

Q. And, if, during a period of say five or six years, if it were all concentrated, if it wouldn't make more than about eight or nine grains, and he took all of that in one dose, do you

think he would be able to notice the effects?

- A. He probably would be able to notice the effects.
   Q. But you are not sure about that? A. No, sir.
- Q. Have some little doubt about it, haven't you?

A. Not much.

Q. Would you say it would be noticeable if he could?

A. Yes.

Q. In its color?

A. No. By means of the spectroscope you could detect the presence of the met-hemoglobin.

Q. Well, we will talk about met-hemoglobin pretty soon, but, let me ask you. If he took that amount of nitrites into his system, in that length of time, would it have any effect on the color of the blood? A. Probably not.

Q. How much would he have to take, to affect the color of

the blood? A. I don't know.

Q. Isn't it a fact that one of the first effects observable is

the color of the blood?

A. Yes, but it is not usually determined by merely being visible to the naked eye, by inspection of the blood, but it is determined by means of the spectroscope.

Q. Yes, but would the color be discernible?

A. By the spectroscope we might detect the presence of met-hemoglobin. We would detect the presence of met-hemoglobin.

Q. How much would he have to take into his system, in the course of ten hours, in order that you might determine its

presence with the spectroscope?

A. I should judge that, if he were to take three grains, or four grains.

O. You could determine it?

A. In eight or ten hours, you could determine it.

Q. Well, if he took eight or nine or ten grains, it would be

plainly discernible by the spectroscope? A. Yes.

Q. But, if a person had taken into his system, during a period of nine hours, ten grains of it, and you could not discern it by the spectroscope, and you were not able to discover anything, by the spectroscope, on the color, what would you say?

A. I would say perhaps the spectroscope was not sufficiently

delicate.

Q. Is that the only answer you can make to that? Wouldn't you say that it didn't have any effect on him?

A. No, sir. It would depend upon the excellency of the

spectroscope.

Q. Are you prepared to say that the spectroscope would disclose any discoloration, in a period of eight or nine hours, if the person had taken ten grains?

A. I think so.

870 Q. You never tasted it, did you? A. No.

Q. Did you ever experiment with any person, to see how much of this he could take into his system, before the spectroscope disclosed that in his blood? A. No.

Q. Now, Doctor-Professor-you say you are not a doctor?

A. Mister, is quite sufficient.

Q. Well, pardon me. I thought you were a practicing physician, as well as a professor in chemistry? A. No, sir.

Q. You have taken a degree in medicine? A. Yes.

Q. That is what I thought. I thought you were entitled to the title. Now, this substance which is taken into the stomach, in bleached flour, as described by Mr. Butler—is that an organic or inorganic nitrite?

A. Please repeat the question.

(Question read by the reporter)

A. In answer to that, I would say I have not investigated the flour in question, but, from my general knowledge, I would say that it is likely that some of the nitrous acid was in combination as inorganic material, and some of the nitric acid as inorganic substance.

Q. Well, when you get the nitrites, now, that we have got

here are those an organic or inorganic substance?

A. It depends. Nitrites are usually looked upon as inorganic substance—nitrites of sodium, nitrite of potassium, and so on.

Q. Now, what I want to know, Doctor, in your experience, in the University of Pennsylvania, or in your experience outside of it, have you, within your personal experience, ever seen a person, where, because of the food he had eaten, which contained nitrites, that he had contracted a case of nitrite poisoning? A. No.

Q. In your experience, as a Professor in the University of Pennsylvania, or outside of that, has there ever come under your observation a case where a person was suffering from

nitrite poisoning, due to the nitrites he had taken into his system in the form of food, or drink? A. No.

Q. Now, you know, do you not, that nitrites are present in a great many different forms of food products?

A. In fcod products that have undergone some change, bacterially, yes.

Q. Yes? You know that nitrites are present in the air, don't you? A. Yes.

Q. You have recently made extended investigations on that,

haven't you? A. Some investigation, yes.

Q. And you have recently found that nitrites were present in food that had not undergone any form of decomposition, have you not?

A. Now, what do you mean by that—food that had not undergone decomposition?

Q. Food which was in a perfectly healthy state.

A. You mean, starch, for example?

Q. Yes.

A. Yes, my investigations were made upon starch.

Q. You have recently investigated the question of the nitrites contained in corn starch, haven't you? A. Yes.

Q. And that is a product intended for food, isn't it?

A. Yes.

Q. You were recently a witness in the case of the State of Pennsylvania against Hoffman, where he was substantially charged with making an adulterated product in the form of a corn starch? A. Yes.

Q. And the question was, whether he had imparted nitrites

to the corn starch, wasn't it? A. Yes.

Q. And you were a witness for Hoffman? A. Yes.

Q. Now, you made quite an investigation in that case, didn't you, as to the presence of nitrites in the starch, which might be imparted to it? A. Yes, sir.

Q. How did you find it was imparted?

A. I found it was imparted to the corn starch by the air, because the corn starch was slightly alkaline in character, and, when the corn starch came in contact with the air, which contains nitrous acid, it absorbed the nitrous acid, forming sodium nitrite, and remained fixed.

Q. And you found that the corn starch which you were investigating, and which was under consideration there, had the nitrites imparted to it, by reason of the

presence of the atmosphere, didn't you? A. Yes.

Q. And do you remember the amount which you found that that corn starch had taken up from the air? A. No.

Q. Let me remind you. Didn't you testify it was about

fifty-seven hundredths part of a million?

A. If that is an official record of the case, I will say yes. but I cannot, off-hand say.

Q. Well, your best recollection is that is right, isn't it?

A. Possibly is.

Q. Now in pursuing your investigations, you went quite extensively into the presence of nitrite in the air, and how it might be taken up, and where it might be taken up, didn't you? A. Yes.

Q. Now, I wish you would tell the jury some of the places where you exposed the corn starch, to see if the presence of atmosphere imparted nitrites to it. A. Yes, with pleasure.

Q. Yes, sir. I know we will all be pleased to hear it, be-

cause I read it with a great deal of pleasure.

A. Corn starch that is made by a certain process, which is called the alkali process, contains, in the finished product, namely, the corn starch, an average of about twelve thousandths of one per cent of alkali, calculated as sodium hydroxide. Now, then alkali has an affinity for hydrogen.

Q. Pardon me, Doctor. I know the court wants to hurry up, and if you will just answer my questions, perhaps we will get along faster. My question was, the different places you exposed this, to see where it would take up the nitrites.

A. Very well, sir, and this alkali corn starch, I exposed wrapped in two thicknesses of foolscap paper, in my bed room,

and another package on the mantle piece above the kitchen range, in my kitchen. And, after, I think, seven days, I have forgotten exactly the number of days—

Q. (Interrupting) Six?

873 A. Six, was it? Six. I examined this corn starch, to determine whether or not it had absorbed any nitrous acid from the air.

O. Nitrites, from the air, you mean? A. Yes.

Q. And what did you observe?

A. I should say, however, that the starch which I employed, and also the caustic soda,—the sodium hydroxide which I employed, were entirely free from nitrous acid, and nitrites in the very beginning, and I found that, after this period—

Q. (Interrupting) One hundred and forty-four hours, is

the way it is here.

A. Yes, after an exposure of six days, the corn starch that contained alkali. which was exposed in my bed room, took up a certain quantity of nitrous acid from the atmosphere, to form nitrite of sodium, and that the corn starch exposed in the kitchen, wrapped in two thicknesses of foolscap paper, also an alkaline corn starch, absorbed a greater amount of nitrous acid from the atmosphere.

O. By nitrous acid, what do you mean is nitrites, here?

A. Yes. But I should like to say, also, that I took some starch, entirely free from nitrites, and free from alkali—that is free from caustic soda, which I exposed under the same conditions, during the same period, and I examined that starch, and found that the starch did not contain nitrites.

Q. It did not take it up?

A. No, sir. It was necessary the alkali should be present.

Q. But a portion of that, you exposed in your bed room, and you found, in that period, it took up twenty-five hundredths parts of nitrites? Isn't that true?

A. If that is the official record.

Q. Isn't it, to the best of your recollection?

A. I can't remember.

Q. That was about it?

A. If you will show me that that is the official record, I will say yes. I have no means—

Q. (Interrupting) No, but without quibbling over the deci-

A. (Interrupting) I am not quibbling over it.

874 Q. You found it took up a considerable amount of nitrites, did you? A. Yes.

Q. Now, that bed room was reasonably well ventilated, wasn't it? A. Yes.

Q. It was the same air you breathed, when you were in the bed room? A. Yes.

Q. And the nitrites imparted to that corn starch were the same nitrites you have been testifying about, being so injur-

ius to health? A. Yes.

Q. And that was simply because the air, circulating through your bed room, came in contact with it, and passed through two layers of foolscap paper, to the corn starch, and the corn starch took it up? A. Yes.

Q. Now, of course, when you breathed that atmosphere, you breathed in those same nitrites, into your system, didn't

you? A. Yes.

- Q. Now, you made some other investigations, exposing the corn starch in some other places, didn't you? Didn't you put some out on the university campus?
  - A. No, not on the university campus.

Q. I think that is right.

A. Some distance from the university.

Q. But you tested the air at the university campus? Now how far is that from the city?

A. Almost in the center of the city. I think it was about a mile from the center of the city.

Q. Well, you found that the air in the university campus contained a considerable amount of nitrites, didn't you?

A. Yes.

Q. As a matter of fact, every place where you exposed it, to any atmosphere, you found that it took up nitrites, didn't you? A. Provided it was alkaline in character.

Q. Yes, certainly, certainly—had some affinity? A. Yes.

Q. I don't use that in the Pittsburgh sense, but in the chemical sense. Now, these same nitrites which were taken up by this alkali, were the same ones which you say would be in this flour, were they not,—the same substance? A. Oh, yes.

Q. One is just as bad as the other?

A. It is the same substance.

Q. Same thing? Now, did you suggest to the commonwealth of Pennsylvania that this corn starch, which had imbibed, or taken up these nitrites, had become an adulterated food product, that was injurious to the citizens of the state of Pennsylvania?

A. I did not, for the reason that the prosecution was not brought for that purpose. The law, in Pennsylvania, states that nitrites shall not be contained in food stuffs.

Q. Well, corn starch is a food stuff, isn't it?

A. There is no statement in the law, as to the injuriousness of nitrites in corn starch.

Q. Oh, I see.

A. And the prosecution was brought on another basis.

Q. Well, as a matter of fact, corn starch which had become charged with nitrites, as you found it to be, would be just as bad for me to eat as flour which had taken up an equal amount of nitrites, wouldn't it?

A. Yes, and, if the question had been asked me at that trial,

I should have answered affirmatively.

Q. Oh, I don't doubt that, Doctor. I don't think you would make one statement in Pennsylvania, and another in Missouri. I don't think that. I don't want you to feel that I insinuated that. But, what I was trying to develop, was the presence of nitrites in so many food products. Now, you have examined the human saliva for nitrites, haven't you, and found that it was present, there? A. Yes.

Q. Did you ever make an examination of any person in

whom you didn't find it present? A. No.

Q. As a matter of fact, whether it is due to bacterial action, or what,—I don't care,—it is present in the saliva of every human being? That's a matter well understood by chemists, isn't it?

876 A. Well, it was present in every sample of saliva taken from the mouth I examined.

Q. That is true, whether it is an infant child, old person, or grown person?

A. More likely in an old person, I should think, than a

child.

Q. Don't you know that it is there, in the mouths of children that are nursing on their mother's breast?

A. Yes, I believe so.

Q. And that child, every time it swallows saliva, is taking nitrites into his system, isn't he? A. Yes, sir.

Q. And continues to do that all the days of his life?

A. Yes.

- Q. And notwithstanding that, there never was a case came under your personal observation, at any time during your connection with the Pennsylvania university, where any of these persons might be brought who had taken nitrites into their system in the form of food product, and you have never seen a case of nitrite poisoning? That's true, isn't it, Doctor?
  - A. Yes.

Q. Now, you know that this is contained in a good many other products, such as cured meats? A. Yes.

Q. It is contained in the fish that are sent out here in the West, that is cured in the East, isn't it? A. Yes.

Q. Now, the nitrites which are contained in that, would be the same character as those contained in flour, or bread?

A. Yes.

Q. One just as bad as the other? A. Yes.

Q. Now, have you ever heard it suggested, in any of your chemical associations, or meetings of chemists, that these articles of food should be tabooed, because of the presence of

nitrite in them? A. No, I never have.

Did you ever read, in a work on hygiene, or the writings of anybody who treated it from the standpoint of hygiene, that articles which contain these minute amounts of nitrites should be discarded as food products, because of the presence of No. nitrites in them? A.

And you have read a good deal on the subject of hygiene.

haven't you? A. No; not a great deal.

Well, as a chemist, and as a professor in the uni-877 versity of Pennsylvania, you keep abreast of these publications, do you not?

Not so much in respect to hygiene, as purely chemical

things.

Well, in any of your chemical journals, or anything, or in your meetings of chemists, has the presence of nitrites in these articles of food that we have had reference to, here, ever been suggested as a reason why those food products should be discarded? A. Not at any meeting that I have attended.

Q. Now in respect to the action, when you take these into the system in the way of food products. It is taken up by the digestive organs, and, in that method, taken into the blood?

A. Yes.

And,-I don't know whether I can pronounce these O. names, but I'll try it,-you have got what is called "hemoglobin" in the blood? A. Yes.

O. Is that a normal constituent of blood? A. Yes, sir. Then the blood of a healthy person, as a normal constituent would contain what you call "hemoglobin"?

A. Yes, necessary constituent.

Yes, that is a necessary constituent? A. Yes. Q.

Now, you say, if I took these nitrites into my system, and they are taken up into the blood, it then forms what you called "met-hemoglobin"? Is that right?

How would you detect that, in the presence of the blood?

By means of the spectroscope. A.

How would your spectroscope disclose it? Is it because of the difference in the color?

Because of the different bands produced in the No.

spectrum.

Well, this infant that takes these nitrites into his system in his saliva,-is its blood being surcharged with "met-hemoglobin"?

A. It would not, possibly, with the quantity that would be produced in the case of an infant; -might not be sufficient to be detected by means of the spectroscope, unless the spectro-

scope were an exceedingly good one.

Q. Have there come under your personal observation, cases where persons were suffering from met-hemoglobin, due to the nitrites taken into the system; in the food that they ate?

878 A. I have never had such a case. I have no knowledge of such a case, except that I know that, when I eat ham that is produced here in the west—which is very good ham—

Q. Yes,-you don't dare to say anything else, in Kansas

City? A. Well, I have come to the West, to learn.

Q. Yes.

A. Receive wisdom from the wiser men of the West.

O. All right, you are imparting yours to us.

Q. That I feel very uncomfortable. I never have examined my blood, under such conditions,—that is, after having consumed ham, but I am inclined to believe that my discomfort is due to the production of met-hemoglobin, due to the reduction of the nitrates of the ham by the bacteria of my intestinal tract, and by the nitrites that have been produced in the ham.

Q. You never examined your blood to see whether that's

the case? A. I never have.

Q. Now, isn't it more likely due to the fact that you ate

too much of it? A. No, I think not.

Q. Well, if you are like the rest of us, here, it is due to the fact you are eating too much, and exercising too little. Now, Doctor, in all your experience in the University of Pennsylvania, in the study of chemistry, you have never had come under your observation a single case where a person was suffering from what was diagnosed as met-hemoglobin, due to the nitrites in his system, imparted by what he had eaten, did you?

A. Such case I never observed; never been brought to me.

Q. Never heard of it? A. No.

Q. And yet you say the child has been taking it into its system by the way of saliva from the time of its birth?

A. Yes.

Q. And we have been taking it into our system, by the water we drink, and by the air we breath? A. Yes.

Q. It is in the very water we drink?

A. Yes; many of them.

Q. It is in the food products we eat? A. Yes.

Q. And notwithstanding all of that, you never heard of a case, or have ever seen a case where a person was suffering from what you call nitrite poisoning, because of what he had eaten, or because his blood contained methemoglobin because of what he had eaten, did you?

A. It is quite possible a number of such cases have occurred, but not to my personal knowledge.

Q. I am talking about your personal knowledge, as a physician. You never have heard of any? A. No.

Q. Now, can you estimate to this jury about the amount of nitrites that would be taken into the system, in 24 hours, in

the form of saliva that goes to our stomach?

A. No, because the quantity of nitrite reacting material in the saliva would vary, very much, with the individual, and also with the volume of saliva given off by the particular individual. I never have made a quantitative determination of the quantity of nitrite reacting material in the saliva.

Q. Returning to this starch matter, again, that you investigated, back there. You found, did you not, that some of this starch had taken up, from the air, as much as 2.8 parts per

million of nitrogen, did you not?

A. If that is the official record, I will say yes.

Q. Well, those are the figures I have. Of course, I can't say that is the official record. It is a copy of the testimony. It isn't certified. A. I suppose it is right.

Q. To the best of your recollection, that is the amount you

found, was 2.8 per million? Is that not right?

A. If that is the correct statement, in the record.

Q. Well, it is what is stated here, but I can't say that that is an official record.

A. Well, I want to qualify it that way, Mr. Smith.

Q. You are not prepared to say those figures are not correct?

A. No, I am not prepared to say they are not correct, nor am I prepared to say they are correct.

Q. Well, you don't recall whether that is correct, or not?

A. No.

880 Q. And all of these that were in there were taken up from the air, were they not? A. Yes.

Q. Do you know as a matter of fact, in what different food preparations corn starch is used?

A. Well, I suppose it is largely used in making pudding.

Q. It is a matter of quite common use, for cooking purposes, is it not? A. I suppose it is.

Q. That is what it is manufactured for, isn't it?

A. Oh, yes. It is edible.

Q. Now, do you know whether or not nitrites are administered as a medicine, to persons who are suffering with

asthma? A. I don't know. I am not a practitioner.

Q. You can't give any information on that. Now, since there has been no case coming under your personal knowledge, or your observation of any person who has ever contracted nitrite poisoning, due to the nitrites eaten, in anything they ate, and since you have never seen a person whose blood was contaminated with met-hemoglobin, due to the nitrites taken in anything he ate, why, your conclusion that this would be injurious is derived wholly from your theoretical knowledge, rather than from any practical knowledge, isn't it?

A. No. From my chemical knowledge, by actual experimenting in the production of met-hemoglobin by the use of

nitrites.

Q. On human beings?

A. Well, on blood outside the body.O. Blood outside the human body?

A. Yes, blood outside the body, and the blood of dogs, in

the dog, itself.

Q. You may draw off some of my blood—I am speaking figuratively, now—in a receptacle, and there experiment with it, and perhaps it would produce met-hemoglobin, but you never discovered it in the veins of a human being, did you?

A. I never have experimented with human beings. I have

experimented with dogs.

Q. All right. Let us talk about human beings. You never discovered hemoglobin in the veins of a human being, did you?

A. I never discovered it, because I never made the at-

881 tempt.

Q. All right. You never found any hemoglobin in the veins of a human being, did you? A. Oh, yes; lots of it.

Q. Well, that was my question, whether you ever did?

A. But you said hemoglobin, Mr. Smith.

Q. Yes, that's what I said.

A. Hemoglobin? You mean met-hemoglobin, do you not?

Q. Yes, I beg your pardon. You never found met-hemoglobin present in the veins of a human being, did you?

A. I never have examined the blood of a human being.

- Q. Well, I want an answer to my question. You never found met-hemoglobin in the veins of a human being?
  - A. Well, now, that assumes that I have made the tests.
- Q. No, it don't assume anything. I asked you the question.

A. I will answer it, by saying, I have never tested the blood of a human being to determine whether or not the met-

hemoglobin was present.

Q. All right, then. Your testimony that the eating of these nitrites in food would produce that condition, is not derived from any personal knowledge, but it is wholly a matter of deduction on your part, isn't it? A. Not at all.

Q. Why, you never saw it in the blood of a human being,

did you, in the yeins of a human being?

A. The action is a chemical action, and the action will take place in the circulatory system. It would take place in the cir-

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culatory system of the lower animals just as well as it would take place outside the body, with the blood outside the body.

Q. But let me get back to my question. You will pardon my suggestion, that, while neither you nor I live in Missouri. we are in the state where they, proverbially, have to be shown. I want to know whether you ever saw, in the blood of a human being, what you call met-hemoglobin?

A. I never looked for it.

Redirect Examination

By Mr. Butler:

Q. If I were to ask you whether you ever had brought to you, a person who was poisoned to death, or practically to death, by strychnine, and you should answer that you had not seen that, personally, would that, in your opinion, Doctor, have any tendency to prove that strychnine is not poison, and might be added to flour?

Mr. Smith: I object to that, as argumentative, and not proper redirect examination.

Mr. Butler: Didn't you argue anything, Mr. Smith?

Mr. Smith: I have a right to argue.

Mr. Butler: But I haven't?

The Court: He may answer.

Mr. Smith: Exception.

By Mr. Butler:

Q. Mr. Smith asked you, many times, whether you had ever seen met-hemoglobin in the blood of a human being, or in the veins of a human being, or in the blood in the veins of a human being. I will ask you to tell us how it is established or known that nitrites will change the normal hemoglobin, the oxygen carrier of the blood, into met-hemoglobin,-the foreign substance that must be eliminated. How is it known

that nitrites do that thing?

A. Oh, it is known, in the first place, from the fact that outside the body blood will be acted upon by nitrites, and will produce the met-hemoglobin, and, furthermore, by my own experiments with dogs. I have the presence of met-I don't care to parhemoglobin in the blood of the dog. ticularly experiment with a human being, by the administration of sodium nitrite, for the production of met-hemoglobin; rather perform the experiment upon a dog, and lower animals. But, it is a chemical action, and if it would occur on the blood outside of the body, it would occur in the inside.

Q. Does this action that you speak of take place in obedi-

ence to a chemical law? A. Yes, sir.

833 Q. As well known as the law of gravity?
A. Yes, sir.

Q. Now, you may tell us whether or not it is recognized that nitrites, taken into the stomach, do, by virtue of that well known chemical law, change the blood in the way you have described in your direct examination? A. Yes.

Q. Did you, Doctor, in the cross-examination of Mr. Smith, have opportunity to say all that you desired to say, with

respect to your testimony in Pennsylvania?

A. Well, in respect to the testimony in Pennsylvania, the action, there, was brought according to the Pennsylvania law.

Mr. Scarritt: We object to that as repetition.

Mr. Butler: Well, Judge Scarritt, I am very sure that you do not want to claim that Doctor Marshall is indicating a position here, different from that in Pennsylvania.

Mr. Scarritt: He has so stated.

Mr. Butler: Well, I am very sure that you gentlemen are anxious that, if he would like to state it fully, that he be permitted to do so. It cannot hurt your clients, or Alsop.

Mr. Scarritt: I want to save time, is why I object to it.

The Court: Well, you are both saving time.

Mr. Smith: Now, of course, I am-

Mr. Butler: (Interrupting) Now, two lawyers jump up and make objections,—if four jump up and object I know we will save time.

The Court: If the witness wants to make any additional statement, he may; otherwise he will go on.

Mr. Smith: I make no objection to that.

The Court: I think I understood what the witness said.

Mr. Butler: Mr. Smith interrupts every witness that he examines. Now, I was not sure that Doctor Marshall had opportunity to answer his questions. It is not a purposeful fault, but a fault of Mr. Smith.

884 The Court: Just a moment. This case is being tried under five divisions of this pure food law, entered by Congress four years ago.

Mr. Scarritt: Three.

The Court: Four. Well, you shake your head until I think three. One of which is with reference to the false branding, and three are, with reference to the subdivision under section 7,-first, fourth and fifth. That makes four. Now, I am right about that, am I not, Judge Smith?

Mr. Smith: I think, though, Your Honor indicated, the other day, certain ones that he checked, here.

The Court: Now, I understood this witness to say, here, that the subject matter of inquiry in the Pennsylvania case, was not with reference to one of these, and I think I understand what the Professor has said here. I don't think there is any use elaborating upon that.

The Witness: Your Honor, I should just like to make one brief statement.

The Court: All right.

The Witness: And that is, that when this case in Pennsylvania was about to be tried, I plainly stated to the individuals that, if this case was based upon that—

Mr. Scarritt: We object to what he said.

The Court: Proceed.

Mr. Scarritt: Exception.

The Witness: (continuing) Based upon the injuriousness of the presence of nitrites in the corn starch, I would drop out of the case, because I couldn't testify.

The Court: Well—I so understood it, awhile ago,—that is, with reference to this discussion, the recital of the Pennsylvania law. The pure food law of congress has that in, under subdivision 5, "if it contains any added poisonous or other deleterious ingredient, which may render such article

885 injurious to health." But I think I understand what the gentleman is saying, and I think the jury does.

By Mr. Butler:

Q. But the nitrites, wherever found, result in injury to health, whether found in corn starch, or in hams, or elsewhere? A. Yes.

Q. Have you ever otherwise testified, or claimed? A. No.

Q. May there be injury to health, if the consumer ate the nitrites, in bread, without any symptoms of nitrite poisoning, and without any poisoning to death by nitrites, from the consumption of bread?

A. Yes, without any observable symptoms.

Q. Then does the fact that no one has ever been brought to you, or come under your observations, suffering from observable symptoms of nitrite poisoning taken in food, prove, or in any manner or degree tend to prove, that the nitrites added to this flour by the Alsop process are not injurious to health?

Mr. Scarritt: We object to that, if your Honor please, because it assumes that nitrites are added, and it is simply argument.

The Court: That is objectionable. Objection sustained.

By Mr. Butler:

Q. May there be injury to health, by nitrites in food, without the person consuming the food ever disclosing any observable symptoms of nitrite poisoning?

Mr. Scarritt: You just asked that question a moment ago.

Mr. Butler: No, I did not.

Mr. Scarritt: Well, he may answer it. Go ahead.

A. Yes.

### By Mr. Butler:

Q. And is that usually the case? A. Yes.

Q. And is it, with many other substances, injurious to health? A. Yes.

886 Q. As a rule is it true, do you think? A. Yes.

Q. Do you happen to know whether the wheat flour is alkaline, as was the corn starch, that you experimented with, that took the uitrites from the air, or whether straight Zour is, normally, acid. A. Wheat flour is, normally, acid.

Q. So it would not, then, take the nitrites from the air?

- A. No.
- Q. And the corn starch which was acid, or which was not alkaline, did not take any, according to your experiment?

A. No.

Q. So, it was solely the alkali that seized the nitrites?

A. Yes.

Witness Excused.

W. R. M. Wharton, called as a witness on behalf of the government, being first duly sworn, testified as follows:

### Direct Examination

By Mr. Butler:

Q. Mr. Wharton, are you an inspector in the department of agriculture? A. Yes, sir.

Q. Bureau of chemistry? A. Yes, sir.

Q. Are you the gentleman referred to in the testimony of Mr. Krite, at the time of the introduction of these pipes which are marked exhibits 14, 15, 16 and 17? A. I am.

Q. Did you take any substances from the interior of these

pipes that are in evidence, here, or any of them?

I took a substance from one of the pipes which was on the bleaching apparatus. It was one of these pipes that is here.

The long pipe that is here was not in use at that

time, was it? A. No. 887

But you took it from one of the pipes that had not been displaced? A. Yes, sir.

Q. And was still connected up? A. Yes, sir.

Which pipe was it that you took it from? Describe

its location in the bleaching plant.

It was a pipe that was standing straight up and down, just connecting with the tank in which the gas was stored, and it was so arranged that, at the bottom of it, this dust would accumulate; at the bottom they had a place to take it off, or let it out.

Well, it was between the generator and the agitator? O.

Yes; between the generator and the agitator. A.

Now, also between the agitator and the generator was a tank, of some size, through which the gas passed, and in which it was delayed in passage? A. Yes, sir.

Now, which end of that tank was it?

A. It was between the agitator and the tank.

And it was down at the bottom of a vertical pipe? Q.

A. Yes, sir.

(Gov. Exhibit 18 shown to the witness) Does that package contain some of the substance which you took from that pipe?

We object to that, if your Honor please. Mr. Scarritt: My sole objection is because it is clearly incompetent. testimony is that that pipe has not been in use for over a year; was standing there, unused, for more than a year. The testimony of the proprietor of the mill is to that effect, and any dust, or anything else, taken from that pipe, a year afterwards,-a year after he ceased to use it,-could shed no light on any issue in this case, and we object to it, for that reason. It is too remote.

The Court: It seems to me that goes to the weight of it, and not the admissibility of it. Objection is overruled,

Claimants except. 888

This is the package that I took.

Mr. Butler: The package and contents are offered in evidence.

Mr. Scarritt: Same objection.

The Court: Same ruling.

Mr. Scarritt: Same exception.

The Witness: I might say that I turned this package over to Mr. A. V. H. Morey.

By Mr. Butler:

Q. That is the chemist at the head of the laboratory, here in Kansas City? A. Yes, sir.

Q. You turned it over to him for analysis and preservation? A. Yes, sir.

### Cross-Examination

By Mr. Smith:

- Q. Where was it you got this substance in the package held in your hand?
- A. I got it out of the pipe which was just between the tank and the agitator.
  - Q. The pipe was not connected up?
  - A. Yes, sir, it was.

Q. Sir? A. It was.

Q. Well, was one connected with the agitator?

A. The pipe was standing horizontally, and there was a pipe leading into the side of that pipe, from the tank. Top of it was closed, and the bottom of it was closed, and there was two other places with valves leading out of this pipe,—three other places, into the agitator.

Q. Was this pipe in use?

A. It was in place, and this was-

- Q. Was it in use? Was it performing any work there in the mill?
- A. It was performing the work of holding the other parts of the apparatus together.
- Q. Well, that is all, was it? There wasn't any water, or anything that way, passing through the pipe?

A. No water; no, sir.

889 Q. It wasn't being used for anything, in the operation of the mill? A. I don't know what you mean.

The Court: Oh,—no flour, or gas, or anything, going through it?

A. No, sir. It wasn't, at that time.

## By Mr. Smith:

Q. The bleacher was not running? A. No.

Q. So, it didn't perform any office, then, in the operation of the mill? A. Not at that time.

Q. There were openings into it, were there, so the air could get in. A. No.

Q. They were all closed? A. Yes, sir.

Q. This pipe that has been offered in evidence, here—was that attached to it?

Mr. Butler: That long pipe?

A. The long pipe was not at that time.

By Mr. Smith:

Q. Now, how did you get this substance, which you have, here?

A. I took the cap off the end of the pipe, and took this substance out.

O. How did you get it out?

A. It would run out very readily.

Q. When you took off the lower part of it?

A. Yes, sir.

Q. Perfectly dry, was it? A. Yes, sir.

Q. And it was being held in place by this little cap, at the bottom? A. Yes.

Q. When you took that off, it dropped out? A. Yes,

Q. If it had been taken out at any time before, it would have dropped out?

A. It was the habit to take it off and let it drop out, and

it would fall out.

Q. Yes, it didn't adhere? When you took the cap off, the dust dropped out? A. Yes.

Mr. Scarritt: Now, we renew our objection to this testimony, and move to strike out the testimony of the witness, for the reasons heretofore stated.

The Court: Overruled.

Mr. Scarritt: Save an exception.

# Redirect-Examination

By Mr. Butler:

Q. I intended to ask, in direct examination, whether these pipes and irons that Mr. Krite referred to in his testimony, which are identified as exhibits 14, 15, 16 and 17, were procured by you from his mill? A. Yes, sir.

Q. At the same time, did you procure the contents of this

package, which is marked Government's Exhibit 18?

A. Yes, sir,

Q. You say the pipe, 14, was not in use at that time?

A. No, sir; it was not.

Q. What about these valves, 15 and 16? Was either one of them in use? They were all attached to the bleacher. At the time of taking them out, Mr. Krite placed his initials on them, and I placed my initials on them, so I can identify them completely and certainly.

#### Recross-Examination

By Mr. Smith:

Q. Where did you find the pipe that is marked Exhibit 14—that is, the long pipe?

A. It was standing against the wall, near the agitator,

Q. Was it in use? A. No, sir.

Q. What part of the mill was it in?
 A. It was on the second or third floor.

Q. Where is this mill? A. East St. Louis, Illinois.

Q. Over in Illinois? A. Yes.

Q. Down in the bottoms?

A. Well, I don't know what you mean by the "bottoms".

891 Q. How far from the river?

A. It is about sixteen blocks, I think, from the river, directly east.

Q. East of the river? A. Yes, sir.

Q. And what surrounds it? A. Houses and buildings.

Q. Other mills?

The Court: Factories, or packing establishments, or what?

A. It is more of a residence district. Well, it isn't exactly that. Railroads run through there.

The Court: Railroad Yards?

A. Yes.

By Mr. Smith:

Q. That is where it is? It was in the railroad yards, wasn't it? A. There's a number of residences.

Q. Railroad tracks around there, were there?

A. Tracks run into the mill, yes, sir.

Q. Switch tracks run back and forth, there?

A. Running to the mill, yes.

Q. Yes? Well, there are other tracks running past the mill, in that vicinity, are there not? A. Yes.

Q. A great many of them? As a matter of fact, the mill, there, is down in the railroad district, isn't it?

A. Not the railroad district proper, no, sir.

Q. Well, then, the railroad district "improper". Is that right? It is down in the business district of East St. Louis, isn't it?

A. It is a considerable distance from the business district. I should say it was three-quarters of a mile from the business district.

Q. How many railroad tracks run adjacent to the mill, or within close proximity to it? A. I didn't count them.

Q. A great many, were there?

892 A. I didn't count them, at all. I know there is a spur track that runs to the mill.

Q. And you know there are other tracks that run very close?

A. I know there are tracks a half mile from there.

Q. Well, don't you know there are other tracks close to the mill? A. No, sir; I do not.

Q. How many tracks were there, close to the mill?

A. I don't know.

Q. Couldn't count them? A. I didn't count them.

The Court: What he is getting at, was there a good deal of soft coal smoke in there? That is a soft-coal country?

A. I should say there was not.

Q. I say, that is a soft-coal country? A. Yes, sir.

Witness excused.

A. V. H. Mory, called as a witness on behalf of the Government, being first duly sworn, testified as follows:

#### Direct Examination

By Mr. Butler:

Q. Where do you live, Mr. Mory? A. Kansas City.

Q. What is your occupation? A. I am a chemist.

Q. Are you employed by the bureau of chemistry, in the agricultural department of the United States? A. Yes, sir.

Q. In charge of the laboratory work in this building?

A. Yes, sir.

Q. Do you know Mr. Wharton, the last witness?

A. Yes, sir.

Q. Did you receive from him this paper, and its contents, which is marked Government's Exhibit 18? A. I did.

893 Q. Did you examine the contents, and analyze it, to find out what it is? A. Yes, sir.

Q. What is it? What does it contain?

Mr. Scarritt: We make the same objection, if your Honor please, that we did to the witness's testimony.

The Court: Objection overruled.

Mr. Scarritt: We save an exception.

A. It perhaps can best be described as a corrosion of iron, and differs from ordinary red iron rust, or that produced on iron, by contact with the air and moisture, in that it contains a quantity of nitric acid, in combination. I might express that more definitely by saying, if figured to HNO3, about 13½ per cent, by weight. This, however, is undoubtedly in combination with the iron, in the form of basic nitrates. There is present

also, oxides, or hydrated oxides of iron, together with this substance that I have described.

Q. You may show the substance to the jury, if you can open the package without spilling it, and tie it up again.

Mr. Scarritt: Same objection.

The Court: Same ruling.

Mr. Scarritt: Same exception.

(Exhibit handed to jury as directed.)

A. I would say that the substance was not quite so finely powdered, as given me, as it is now; that I ground it in the mortar, in order to get a better sample.

### By Mr. Butler:

Q. Now, HNO3 is nitric acid? A. Yes, sir.

Q. Now, if you express the same thing in terms of NO2, required to produce nitric acid—

A. (interrupting) From close to 10 per-cent of NO2, by

weight.

Q. 10 per cent?

- A. I might also add that the oxides of iron existing with the nitrates would naturally be formed by the action of electrolytic action, resulting from the presence of NO2, or nitric acid and moisture.
- Q. These things that you speak of are such as would be produced by nitric acid coming in contact with the inside of the pipe? A. Yes, sir.

## Cross-Examination

By Mr. Smith:

Q. This package contains a slight amount of iron rust, does it?

A. It might be called that, but not what is commonly called iron rust; no, sir.

Q. Well, it is an iron rust, isn't it, in combination with something else?

 It [—] corroded iron, corroded in the manner I have described.

Q. And by that you mean small particles of the surface of the iron that have become rusty, and detached?

A. It had that appearance.

Q. Now rusty iron is not an unusual thing to find, in different places? A. Not at all.

Q. And what was there in combination with this rust?

A. Nitric acid.

Q. Nitric acid? In what relative proportions?

A. I stated that the quantity, figured to HNO3, nitric acid, was 13½ per cent, by weight.

131/2 per-cent of this you had in here would be what?

HNO3, nitric acid.

And what would be the balance? 0.

Well, the rest of it is iron oxide, and hydroxide, in combination, as I expressed it.

You would get 131/2 per-cent of it, would be HNO3, then

there would be 861/2 per-cent, would be what?

The iron, oxygen and hydrogen necessary to make the combination described.

Iron, we understand what that is. Oxygen is a constituent element of the air, is it? A. Yes.

Q. And hydrogen is a constituent element of water?

A. Yes.

Q. So you would have some iron, and some air, and some water, what else? Would that make up the 8615 895 per-cent? A. Yes.

O. So, you have got 131/2 per-cent HNO3, that is combined with a certain amount of iron, a certain amount of air, a certain amount of hydrogen, or a constituent element of water.

A. I neglected to state, about 21/2 per-cent of carbonaceous

matter.

O. What is that?

Possibly graphite that is combined with the iron. Almost a neglected quantity, that I didn't state.

Q. But this is a fair statement of the composition of the substance you have got there? A. Yes, sir.

Q. 131/2 per-cent HNO3, and 861/2 per cent, iron, oxygen, and hydrogen? A. Yes, sir.

Q. And did you use the entire quantity?

A. No, I didn't.

Well, as the witness brought it in to you, did you measure

the entire quantity?

A. I did not. I did not consider that an important point, and it didn't occur to me to do so. The amount isn't greatly different from what you have there. Perhaps diminished by one-quarter.

Mr. Smith: Was this offered in evidence?

Mr. Lyons: Yes, sir.

Witness Excused.

E. H. Grandberry, called as a witness on behalf of the 896 Government, being first duly sworn, testified as follows:

# Direct Examination

By Mr. Butler:

Q. Where do you live, Mr. Grandberry?

A. Junction City, Kansas.

O. What is your business? A. Milling.

Q. How long have you been a miller? A. 35 years. Q. Are you the proprietor, or one of them, of the mill?

A. Operative miller. Employed as a miller.

Q. In what concern? A. Hogan Milling Company.

Q. At Junction City? A. Yes, sir.

Q. How long have you been there? A. About a year.

Q. And before that, where were you employed?

A. Abilene, Kan.

Q. By what milling company?A. Security Milling Company.

Q. How long were you there? A. Close onto a year.

Q. Prior to that, what experience did you have?
 A. Cramer Milling Company, Anthony, Kansas.

A. Cramer Milling Company, Anthony, Kansas.
Q. That is the same Cramer who used to be at Wellington, Kansas? A. Yes, sir.

Q. Have they mills in both places? A. No, sir.

Q. But they used to have? A. Yes, sir.

Q. They sold out at Wellington to the Aetua Mill & Elevator Company, I believe? A. Yes, sir.

Q. How long were you there with Cramer brothers?

A. I was with Cramer brothers 7 years.

- Q. Have you ever used an Alsop bleaching machine?
- A. I have used an Alsop bleaching machine about a year and a half, I think.

Q. Where? A. At Anthony, Kansas.

Q. That was while you were working for Cramer brothers?
A. That was while I was connected with the Cramer milling Company, at Anthony, Kansas.

Q. Does this mill where you now work, bleach?

A. No, sir.

Q. Did they ever, so far as you know?A. So far as 1 know they never bleached.

Q. The mill isn't fixed for bleaching? A. No, sir.

Q. What is the effect upon the color, of treating flour by the Alsop process? A. You mean the color?

Q. Yes, sir.

A. Well it has the effect or tendency to make it whiter.

Q. The bleaching of a straight flour, or a long patent flour, produces what color, in comparison with a short patent, or good, patent flour?

A. Well, I hardly think that I could define the difference.

It seems to be about the same—are the same.

Q. Now, before they are bleached, is there any difference between a short patent and a straight flour?

A. Before it is bleached?

Q. Yes. A. Yes, there is quite a difference.

Q. Now after bleaching, is the difference more, or less?

A. Yes, there is quite a difference.

Q. Does bleaching tend to make a straight flour look like

a patent? A. I would say yes.

Q. Now, as to the effect of natural aging. What is the effect of bleaching upon fresh flour, with reference to producing an appearance like naturally aged flour?

A. Well, I hardly think it has the same appearance, in the

way of bloom and life, and color.

Q. Has naturally aged flour the same, or different color, of that flour before natural aging?

A. Comparing the two, there is a difference.

Q. Now, as to the bleaching. Does the bleaching make the fresh more like naturally aged, before the bleaching, or less?

A. I think not.

Q. You think it does not bring them nearer together?

A. Not to my judgment.

- 898 Q. Are you familiar with what is known as "patent" flour?
- A. Well, as a term used for distinct, patent flour, I know what that is,—what we call a patent flour,—made of middlings.

Q. Are you familiar with Turkey hard wheat? A. I am,

- Q. Did you hear the testimony of Mr. Tucker who made this flour? A. Yes, sir.
- Q. You are familiar with the term "patent", as it is used in the trade, and by millers? A. Yes, sir.
  - Q. You heard him describe his yield, did you?

A. Yes, sir.

O. And the quality of wheat used? A. Yes, sir.

Q. Now, I will ask you, in your opinion, whether or not there could be made from the wheat, 4 bushels and a half of the wheat he had, counting 59 pounds to a bushel, his 90 per cent flour, or fancy patent?

A. I wouldn't consider it a fancy patent.

Q. Do you know what effect the bleaching of flour has upon the quality of the flour—its dough, and the like?

A. To a certain degree, I do, for my own particular use.

Q. Have you doughed the flour? A. I have.

Q. What effect does it have upon it?

A. It has a tendency to weaken the flour, or weaken the

dough.

- Q. Now, as to the strength of that tendency, if it is strongly bleached, heavily bleached, does it weaken more than if only lightly bleached? A. That is my observation of it.
  - O. Do you know whether ble ched flour improves with age?
- A. From just my observation and study of it, I think that it degenerates—it goes back.

Q. Does it work that change after it has been bleached, or does it remain fixed?

A. Well, to a certain degree it does change, just a little bit. It degenerates, and, naturally, in that state, it is more dead than it was right at the time it was bleached.

Q. What effect upon the color has this change or degener-

ating as you call it? A. What effect?

899 Q. What effect does it have upon the color—the change in color, by this degeneracy?

A. I would say slightly lacking in the life of the color of the flour. It is more ashy and deadly.

Q. How long, altogether, have you milled, in Kansas?

A. I am 52 years old, and I came to Kansas when I was about 22.

Q. You have milled in the State of Kansas ever since?

A. No, I milled in Colorado for about 4 years.

Q. Now, which wheat makes the whiter flour—the soft, winter wheats, or the hard winter wheats, each being milled for the purpose of making white flour?

A. I understand. The softer natured wheat always makes

whiter flour than a harder natured wheat,

Q. A soft wheat? And is that true of the Turkey hard wheat, and the wheat of Missouri, southern Illinois and Iowa?

A. The softer the nature of the wheat always makes a whiter wheat.

Q. Have you had opportunity to observe which makes the whiter flour, the hard turkey wheat, of Kansas or the spring, hard wheats of the north and northwest?

A. The hard turkey wheat of Kansas makes a whiter flour

than the hard wheat of the northwest.

Q. Can you tell us, generally, whether or not this bleaching process makes a flour appear to be of higher grade, or standard, than it is, in fact?

Mr. Smith: I object to that, as leading and suggestive, no proper foundation has been laid.

The Court: He may answer.

Mr. Smith: Exception.

The Witness: Will you repeat the question?

(Last question read)

A. Just from observation, without any comparison, it does. By Mr. Butler:

900 Q. That is what you mean, when you observe it, without bringing it into comparison with some standard?

A. Yes, sir.

### Cross-Examination

By Mr. Smith:

What do you mean by a "fancy patent"?

Well, I don't designate mine by "patents".

By Mr. Butler: Mr. Smith, there was one more question I wanted to ask.

Redirect Examination

By Mr. Butler:

Q. Have you ever observed flour that was overbleached by the Alsop process? A. Not to the extent-

Q. (Interrupting) I mean to the extent of becoming yel-

low?

How does that happen? To what extent did it require

bleaching?

A. Well, it is accumulation that would probably gather in the flow of the mill, and it seems to have that yellow appearance of the color, and I judge from that it is overbleached, because you never get that cast. I never got that cast in any other conditions, only bleaching flour.

O. Except when you are bleaching, you have never found

that yellow flour? A. No, I never found that yellow.

Now, did you ever observe whether or not that vellow flour, or that flour made yellow by bleaching, goes into the merchantable flour? A. Yes, it will.

Tell us about that, and how it is that happens. I am

now speaking of the Alsop process.

Well, I will say, if I may be permitted to state just exactly how it happened-

I think that is the best way; yes. O.

We put in the Alsop bleacher, and I was ignorant, and didn't have the proper knowledge of knowing how to manage that machine, so, it was recommended to me, or represented to me, that there was no trouble, at all, about

901 handling that machine that just to start it up, and let it go, and it would do the work it was required to do. In the course of a month or two, I had a complaint on my flour, and, on investigating what this trouble was, I found that some particular customers, or one customer, especially, had found what I term a "dough-ball"-a little ball that was created from moisture of some kind, and rolled up and formed a ball, and in sieving out this flour for making bread,-it was a wire sieve with a centrifugal beater-it busted this "dough-ball". The centifugal beater busted this "dough-ball", and it had such a bad odor that the lady made complaint of the flour being There was something matter with it, and on investigating, I found that the accumulation of moisture, or different objects,-I don't know what it is,-had gotten into the agitator, or blender, or the mixer, and through the mixer into the flour sack, and that's the first complaint I ever had of the bleached flour.

Q. Tell us whether or not that is a frequent occurrence that these balls will form in the flour, by this overbleaching?

A. Well, I aimed to remedy that, by putting in a little reel or separator, whatever you call it, something to bolt those formations out of my flour before it went to the sack.

Q. That is, after it had passed the agitator?

A. After it had passed the agitator. I was compelled to put in something to purify the flour, after it had passed through the agitator.

Q. Purify it in what way?

A. Purify it, or bolt it, or separate it, or sift out the impurities that accumulated in the agitator, into the flour sack. Sifted it. Separated that.

Q. Describe those things that accumulated in the agitator

from bleaching?

A. It was a formation created, I suppose, from moisture, and the flour coming in contact with that moisture would form a ball—stick, and form a ball, and in that way it would

retain its shape, as a little marble, and go into the 902 sack in that condition, and stay in that condition until you would put some pressure of some kind, or some method of breaking it open.

Q. Now, what was the color of it, when broken open?

A. I am not very much of a hand on color. It was something like that chair, there—the color of that chair, there, whatever you would call that.

Mr. Smith: Light oak?

By Mr. Butler:

Q. Brown? A. Kind of a brown, yes.

Q. And the character of the ball, now, as to smell, and taste? I don't mean how much, but I mean the smell and taste of it, if you know?

A. Well, it had an odor that we got from the effects of this arc and flame that we got from this bleaching.

Q. That is, in the gas generator? A. Yes, sir.

Q. Did you ever taste it?

A. I didn't want to, but I got a little on my lips, putting my mouth to the pipe. I didn't know what it was, and I put my mouth down to the pipe, to blow some little accumulation out of there, that was in the valves, and I got some on my lips, and it tasted very bad.

Q. Now, I want to get at the number of these that would accumulate. You say you tried to screen them out?

A. Yes, sir.

Q. Now, about how many of these would accumulate?

A. Oh, not very many. Q. About how many?

A. Oh, just now and then? I never stopped to measure them, or anything of that kind. It was only just an accumulation of that kind of stuff that I wanted to keep out of my flour sacks.

Q. Now, was that the only Alsop bleacher that you ever worked about? A. Yes, sir.

#### Cross-Examination

By Mr. Smith:

903 Q. Now, going back to the question I put. What do you mean by a "fancy patent"?

A. I don't know what "fancy patent" means.

Q. So, you are not able to define it? You don't know what kind of flour it takes to make a "fancy patent"?

A. Well, the word "fancy patent" is a pretty broad assertion.

Q. Well, we have learned that since we have been here.

A. Yes. It is pretty broad.

Q. Depends on the miller, don't it?

A. Well, it wouldn't be—I don't know how to define a "fancy patent", only in one way.

A. Well, what way is that?

A. That would be by percentage.

Q. Did you ever work in any two mills that had the same percentages? A. Yes, sir.

Q. What two?

A. Aetna Mill Company, of Wellington, Kansas, and the Anthony Mill Company, Anthony, Kansas.

Q. What were their percentages?

A. From 80 per cent. 80 per cent.

Q. From 80 to what?

A. Patent, middlings flour.

Q. You said 80 to what?

A. Oh,—100 per-cent. I always make that on a basis of 100.

Q. You don't mean they made a patent running from 80 to 100 per-cent? A. No, sir.

Q. Within what limits did their patents vary?

A. Our patent flour was an 80 per-cent patent. Then, we made three grades of flour, you understand.

Q. How many grades of patent did you have?

A. I had one patent flour, 80 per-cent.

Q. Well, did you put out different grades of flour, that were branded a patent, and have some name connected with it, as "first patent" or "second patent", or something that way?

A. No, sir.

Q. What did you call your patent?

A. The patent that I am making now is the "Best Yet".
Q. And you brand the "Best Yet" as a patent, do you?

A. Yes, sir.

Q. What per-cent do you put in?

A. 70 per cent.

Q. When you were at Wellington, making the 80 per 904 cent. What did you call that? How was it branded? A. That was "Cramers High Patent", I think.

Q. And that had 80 per cent, did it? A. Yes, sir.

Q. Now, what was the difference between your 80 per cent, and your 70 per cent? A. There was 10 per cent.

Q. Well, that is in figures, but was there any difference in

the quality of the flour? A. Yes, sir.

Q. How do you come to make 80 per cent one of them, and 70 the other?

A. It is according to our standard to mill.

- Q. Now, where else did you work? I didn't take down all these places?
  - A. Colorado Milling & Elevator Company, Colorado,

Q. And what per cent did you make, there?

A. We made a 90 per cent, there.

Q. Patent? A. That was a straight flour, Q. Well, I am talking about patent flour, now.

- A. No, I hardly think, those days, the days I was with those people, there wasn't any such thing as a patent flour, then.
  - Q. You didn't make just the 90 per cent straight, did you?

A. Yes.

Q. Straight flour takes in all the run of the flour, don't it?

A. No, sir.

Q. Except the tailings?

In that section what is called a "Red dog".

Q. Yes. Straight flour takes in everything but the Red Dog? A. Yes.

Q. And you just run 90 per cent in the straight, and 10 per cent into the "Red Dog"? A. Yes, sir.

Q. But did you sell the Red Dog as flour?

A. That was mingled with the feed product, in the mill.

Q. Then, the fact is, these different places you worked, you had different standards of patent?

A. Some places 70 and some places 80; yes.

Q. And did you make that 80 per cent at the mill, irrespective of the kind of wheat you got? A. No, sir.

905 Q. Then it varies with the quality of the wheat?

 $\Lambda$ . I have a standard, with my wheat, the same as I do with my flour.

Q. Now, you spoke of the different kinds of wheat. Have you had any experience milling Nebraska wheat?

A. Some; yes.

Q. How long since? A. A year and a half ago.

Q. Where was it raised?

A. Really, I can't tell you just exactly where it was raised.

Q. Now, in the different grades of wheat, as you get, do you grade them simply according to the wheat? A. Yes, sir.

Q. Now, in your section of the country, do you get a strictly turkey red? A. No, sir.

Q. You don't get any of that? A. No, sir.

Q. Do you get any number 1 wheat, at all—what grades as number 1, hard? A. No, sir.

O. None at all? A. I get about 20 per cent.

Q. How many pounds to the bushel does that weigh?
 A. That No. 1 isn't graded in Kansas, now, understand.

Q. Then you don't have anything in Kansas that is graded Number One? A. No, sir.

Q. Where did you get it?

A. I get a grade that is superior to a No. 2 Kansas hard wheat.

Q. Where did you get it?

A. In the western part of the state.
O. But it is graded No. 1, or No. 2?

A. It is graded as No. 2.

Q. So, as a matter of fact, No. 2 hard wheat is the highest grade of wheat on the market in the State of Kansas, isn't it?

A. Yes, sir.

A. Yes, sir.
 O. The highest wheat which you get is graded as No. 2?

A. Yes, but I pay a premium for a superior, hard, turkey wheat.

Q. All right. That weighs how many pounds to the bushel?

A. 60 pounds.

Q. That which grades No. 2 on the market, and it sells at the elevators, and in the open market, for No. 2, in-906 cludes wheat that weighs how much? A. 59 pounds.

Q. So, on the market, and in the trade, as it is understood, wheat which weighs 59 pounds to the bushel, is No. 2 hard wheat, is it?

A. Reasonably clean, dry, plump, sound wheat.

Q. And that is the highest grade known to the trade, isn't it? A. That is, in Kansas.

). In Kansas; yes, sir. A. Yes, sir.

Q. Now, is it an unusual thing for a miller to sometimes find in his flour a defect? A. Oh, quite frequently.

Q. And you do that, whether you have got a bleacher or not, den't you? A. Well, now, let's see—

Q. (Interrupting) You found defects in flour, before you ever heard of a bleacher, didn't you? A. Well, yes; I have.

Q. Millers haven't reached the point where they are absolutely perfect in anything, have they?

A. No. There's no one perfect.

Q. And as long as you mill by machinery, there will be defects, because of defects of the machinery, or because of some little accident or something, there will be some defect in the flour, won't there? A. Likely so; yes.

Q. Did you ever hear of a "dough-ball" before you had a

oleacher? A. Quite frequently.

Q. You have found "dough-balls" in flour before you had a bleacher, didn't you? A. Yes, sir.

Q. What do you mean by a "dough-ball"?

 Well, a "dough-ball" is created from moisture coming in contact with the flour.

Q. And you have had flour coming in contact with moisture, before you ever heard of a bleacher? A. Yes.

Q. And those "dough-balls" are not a desirable thing, in any flour? A. No, sir; not a bit of it.

Q. If a housewife finds a "dough-ball" in the flour, you always hear from it? A. Sure.

Q. Because that is a defect in the flour? A. Yes, sir.

Q. Now, you had "dough-balls" in the flour before you ever heard of a bleacher? A. Yes, sir.

907 Mr. Smith: That is all.

### Redirect Examination

By Mr. Butler:

Q. Were these the same kind of "dough-ball"?

A. Not quite,

Q. They didn't taste the same, or smell the same?

A. Not quite, Brother Butler.

Witness excused.

Court thereupon adjourned to 10 o'clock a. m. Saturday, June 11, 1910.

Saturday morning, June 11, 1910.

Pursuant to adjournment, Court met at 10 o'clock a. m., Saturday, June 11, 1910, and proceeded with the trial of said cause further as follows:

C. H. Barnard, called as a witness on behalf of the Government, being first duly sworn, testified as follows:

# Direct Examination

By Mr. Butler:

Q. Your name, please? A. C. H. Barnard.

Q. Where do you live? A. At Wellington, Kansas.

Q. And your occupation? A. A miller.

How long have you been a miller? Q.

About 33 years. A.

Q. And where?

- I worked under my father, in Illinois, until I was 23. A. I then took charge of a mill.
- Q. Have you had charge of a mill all the time since 908 then? A. Yes, sir.
  - And where are you now? A. Wellington, Kansas. Q.
  - What mill? A. Hunter Milling Company's plant. Q.

Is there more than one mill at Wellington? Q.

A. Three.

And what are their names? Q.

Aetna Milling Company, the Wellington Mill & Elevator Company, and the Hunter Milling Company.

Have you ever used a bleaching process in any mill of

which you had charge? A. I never have.

Q. Did you ever make any investigation of bleaching processes for the purpose of enabling you to determine whether or not you would install one in the mill in your charge?

I did. A.

- When was that? Q.
- A. I think it was about four years ago,-in 1906.

What did you do in that regard?

- Well, I took two sacks of flour, and took one over to A. the Aetna Mill, and had one sack bleached, and took them both home.
  - Q. Was there a bleacher in the Aetna Mill? A. Yes, sir.

What kind? A. Alsop. Q.

Q. Well, go on, and tell us what you further did, with reference to that flour?

At the time I commenced the investigation, my company was thinking strongly of-

Mr. Scarritt: (Interrupting) Never mind what the company was thinking. We object to that, Your Honor.

The Witness: (Continuing) Installing a bleacher.

Mr. Scarritt: That isn't responsive to the question.

The Witness: Well, I was thinking strongly of installing a bleacher.

Mr. Smith: Well, that is the same thing; we object to that.

The Court: He says what ne means was, he was considering the proposition, and investigating it. I don't know.

The Witness: That's it.

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909 The Court: I suppose you object to the word "strongly".

Mr. Butler: No,-"thinking".

Mr. Scarritt: He said he was "thinking".

The Court: Well, all right.

The Witness: And to ascertain, if possible whether we should put in a bleacher, or not, I had this flour bleached, took it home, and had my wife bake it. I didn't like the—

Mr. Smith: Well, I object to his stating his likes and dislikes, as being wholly immaterial.

The Court: Yes, you will have to state what you found.

The Witness: Well, I baked a loaf of bread out of the unbleached, and baked a loaf out of the bleached.

By Mr. Butler:

Q. Same kind of flour, except that one was bleached by the Alsop process, and the other wasn't? A. Yes, sir.

Mr. Scarritt: In that mill?

The Court: In the Aetna mill, at Wellington, Kansas, as I understand it.

The Witness: I had it bleached there, but the flour wasn't made there. I made it, myself.

The Court: The flour was made in your mill?

The Witness: Yes, sir.

The Court: Bleached in the Aetna?

The Witness: Yes, sir. And the loaf of bread made from the bleached flour was no whiter than the one made from the unbleached. The odor from the bread was disagreeable.

The Court: In which loaf?

The Witness: The bleached. A short time afterwards, I took a sack of flour, and went to the Howard mills, in Wichita.

By Mr. Butler:

Q. A sack of flour which you made?

A. Yes, sir. They were not in position, at that time,—
910 too busy—to bleach it for me. In lieu of that, they gave
me a half a sack of their unbleached flour, and a half sack
of their bleached flour. I brought that home, and made the
same test, and found the same results.

Q. As you did in the case of the other flour, bleached at the Aetna Mill & Elevator Company?

A. Yes, sir. After a few weeks I took two sacks of flour to the Wellington Mill & Elevator Company, had one of them bleached, took them both home, baked them, and found the same results.

Mr. Scarritt: Was that your own flour?

The Witness: That was my flour.

By Mr. Butler:

Q. Same kind of flour that you tried the first time, at the

Aetna mill and elevator company?

- A. Yes, sir. The three trials were the same grade of flour, that I made myself, but bleached on three different systems.
- Q. What were they?
  A. The first one was the Alsop, and the second one a bleached named the Werner, Mr. Larabee, at Stafford, was selling the machine, and the one at the Aetna was the Naylor & Girard.
  - Q. What kind of flour was it, that you made, yourself?

A. Patent flour.

Q. And what percentage? A. 75 per cent.

Q. That is, 75 per cent of the total flour produced from the

wheat? A. 75 of 100.

Q. Did you, in these instances, observe any comparison between the quality of the dough, as it was doughed up, of the one, compared with the other? A. Yes.

Q. What did you observe in that regard?

A. Well, the dough from the bleached flour wasn't as elastic as that from the unbleached. It appeared to be short.

Q. Did both the other mills at Wellington bleach?

A. They had been bleaching for several years. I don't know that they do, now.

911 Q. I mean, at this time?

A. No, I don't know that. They have the bleachers in their mill, but I don't know as they bleach.

Q. What is a patent flour, Mr. Barnard?

A. It is a purified middlings flour.

- Q. How much of such purified middlings can be obtained from the hard wheat?
- A. 80 per cent is the maximum. Possibly, in some instances, a half of one per-cent more.

Q. Can there be 90 per cent of such middlings procured?

A. No.

Q. Can you tell us, historically, how the phrase "patent flour" came to be used?

A. Well, sir, prior to about 35 years ago, millers, all over this country, in milling on the stone system, had to store their middlings. In those times we called it "shorts". And, when

they got their bins that they had for storing that middlings full, they would simply shut off the wheat, and grind those middlings, by themselves, on the stone, and then they would take the flour that they got from that middlings, and feed it into the regular run of the mill, when they was grinding wheat again, and, as long as that lasted, that flour, they found their flour was better.

Q. That is, the flour produced by grinding the shorts over again, when added to the flour first produced from the wheat,

improved that, and they counted it better?

A. Yes, sir. Then, the middlings purifier was invented and put on the market, and we went to purifying that middlings, or that short, and grinding it on a separate stone, and mixing it in, and then, finally, we got to taking that out—that middlings flour—and putting it into a sack by itself, for the simple reason it was better flour, and millers simply called that "a patent flour", because it was made on a patent purifier. That is, the middlings were, properly. We then set our wits to work to make more of that middlings, and, in the beginning, we only made about 15 per cent of that patent flour, and we kept improving our systems, and finally put in the rolls, which enables us to make enough middlings that we could purify,

and these purifiers make as high as 80 per cent, and I am sure that there is no mill in the United States that has ever made more than that out of purified middlings.

Don't believe it can be done.

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Q. What is a "straight" flour?

A. Straight flour? Well, we make a straight flour that is 97 per cent. It runs from 95 to 97 per cent of the whole.

Q. What do you call the remnant?

- A. We call it low grade. Some millers call it "red dog".
- Q. And, in your mill, is that remnant,—3 to 5 per cent of low grades—is that sold as flour?

A. That is sold as flour; yes, sir.

Q. And what do you call it?

A. Call it flour. Don't call it anything. Just put the word "flour" on the sack. Put it up in 140-pound jutes,

Q. Have you had opportunity to observe the color of different grades of flour, from the same wheat—that is, short patent, and the long patent, and the straights, and the clears, and the low grades? ... Wes.

Q. What is the relation of color? What does color indicate

with respect to that?

A. Well, it doesn't always indicate quality for the reason that our 75 per cent is much more yellow than a 22 per cent clear. That is, as it appears in the dust, under the slicker. And our straight grade has a whiter appearance than our 75

per cent patent. Our low grade, of course, in all cases, is darker than any of them.

Q. That contains some foreign substances—the low grade?

A. Yes, sir.

Q. 3 to 5 per cent low grade? A. Yes, sir.

- Q. Now, have you been able to observe the change, if any, in color and quality, that takes place in flour that is naturally aged?
- A. Oh, yes. When it happens to be stored in a warehouse, after four or five weeks, or longer, it gets whiter,—
   913 gets more mellow; puts it in a condition for absorbing

more moisture, and improves with aging.

Q. In what respect, when you say it "improves"?

- A. Well, in the respect it will take more water, and is easier worked.
- Q. And with respect to the quality of the gluten, or elasticity of the dough? A. Well, it makes that better.

Q. Elasticity of the doughs increase?

A. It improves the elasticity, and the expansion of the gluten is greater; shows it improves the strength of it.

Q. The color is lighter, and the gluten more expansive?

A. Yes.

Q. The dough more elastic?

A. Yes, sir. That has been my experience.

Q. And the dough takes more water, in the baking process?

A. Yes.

Q. Now, the effect of bleaching on the new flour, upon its color, as compared with the change wrought by aging and conditioning?

A. You mean flour from new wheat, or just fresh made flour?

Q. Yes.

A. Well, it whitens it, and yet it isn't the same white as it it where it is naturally aged.

Q. Does it bring the color nearer together?

A. Oh, yes.

Q. And the effect of bleaching, upon the gluten, and breadmaking qualities, doughing, and the like?

A. Well, I am not prepared to explain that, Mr. Butler, be-

cause I am not a baker.

time to time?

Q. Have you, aside from these occasions when you were investigating the bleaching processes, had opportunity to observe the different grades of flour that had been bleached?

A. I have taken no further notice of the bleaching proposition, since, any more than I come in competition with it.

Q. Yes. That is what I mean. And, in your work, in selling your flour, and competing with others, and all,
 914 have you had opportunity to see bleached flours, from

Yes, I have seen it.

That is what I meant. And have you seen bleached Q. flour, of brands with which you are familiar, and made at mills where you are familiar with it? A. Yes,

What mills?

A. Well, the two mills at Wellington; mill at Arkansas City, Carthage, Missouri; mill at Nevada-not Nevada, but Newton, Kansas, and I have seen it here in Kansas City-Kansas City, Kansas. But it never bothered us, and we never took any further notice of it in our business.

Mr. Scarritt: I understood him to say he had seen that both in Kansas City, Missouri, and Kansas City, Kansas, or did he change it?

The Witness: Just Kansas City, Kansas.

By Mr. Butler:

Were you familiar with the output of the Aetna Mill & Elevator Company, when they were using the Alsop process?

A. Yes, sir.

Q. Have you seen their flour, bleached? A. Yes, sir. And were you familiar with it, unbleached? Q.

A. Yes, sir.

Q. What was the effect of the bleaching, upon the appearance of the flour? A. Well, it made it look much whiter.

During the time they were bleaching, what did you do with your clears?

We sold a good deal of it to them. A.

What brands were they putting out, at that time? Q.

A. Well, they call it "Silk".

Q. "Aetna Silk"? A. Yes. "Aetna Silk".

Q. High patent? Is that the brand? A. That's the way they had it marked.

And the clears that you were selling to them, there, was that which was taken out, after your patent was taken off?

A. Yes.

Q. And you were taking off how much patent, at that time?

A. 75 per cent.

75 per cent? And leaving 22 per cent, or such a matter, clear? A. Yes, sir. 915

Q. And that you sold to the Aetna Mill & Elevator

Company?

A. We didn't sell it all, but some of it. We sold them quite a lot of it.

Q. How far apart were your mills?

About 12 or 15 blocks, something like that,-probably 15 blocks.

Q. And where was the flour which you sold to them delivered? At their mill, or to their customers?

A. I delivered it to the mill.

Q. What is a "stuffed straight", if there is such a thing?

A. Well, as I said, we get 95 to 97 per cent straight grade. If a man can add any clear flour, or any other flour, and run it up to 110 or 120 per cent, he has got that straight stuffed with something else.

Q. That is, if you take all of the flour content of the wheat, and then procure from some other place some other

flour, and add it to that, it is a "stuffed straight"?

A. Yes.

Q. Now, in the case of bleaching of such flour. Could it be made to resemble, as respects color—I don't mean exact identity—but could it be made to resemble patent flours, as respects color? A. Oh, yes.

Mr. Helm: He is speaking of a clear, is he not, Mr. Butler?

Mr. Butler: He is speaking of a "straight stuffed", where you take straight, and add a clear from somebody else's, and put it into the straight and bleach it, and that it can be made to resemble a patent flour.

Q. Now, generally speaking, what is the effect of bleaching, upon varying grades and colors of flour, as to whether it tends to make them look alike, or tend to make the appearances more widely different?

A. Well, you bleach the patent. You don't have to bleach the clear flour as much as you do the patent flour, to

916 make them look alike, for the simple reason that most good mills, 22 to 25 per cent of clear is naturally whiter—looks whiter than the patent.

Q. Not so much creaminess in the color?

A. Not so much creaminess in the color, and, for that reason, as I understand it, they don't bleach clears so heavily as they do the other—the patents. And, by doing that, and then blending them, they make them look whiter [that] the patent or the clear, either one.

Q. Tends to bring the colors together? A. Yes.

A. And make all lighter?

Mr. Butler: I think that is all.

### Cross-Examination

By Mr. Smith:

Q. What is the capacity of your mill, Mr. Barnard?

A. 1500 barrels.

The Court: In 24 hours?

A. Yes.

By Mr. Smith:

Q. That is your daily capacity. What, as a matter of fact, do you run? To its full capacity?

A. Well, not all the time.

Q. Well, say, during the last year. About what has been your average daily output?

A. About 1,000 barrels.

Q. What was it the year prior to that?

A. Well, it was more than that, the year prior to that.

Q. About what was it, that year?

A. From 11 to 12 hundred, something like that.

Q. 11 to 12 hundred? What was it the year before that?

A. I don't remember, the year before that. That would

be about 1906. That year we increased our capacity.

- Q. No, last year was 1909, the year before that 1908, and that would be 1907, wouldn't it? In 1907, what would it be?
- 917 A. I judge, in 1907, about 900 to 1,000, the average. Q. Then, last year it was just about the same as it was two years ago? A. Yes, sir.

2. The year in between them, it was more than that?

A. Yes, sir.

Q. You never bleached flour, you say?

A. Never did.

Q. The other mills there in Wellington both bleached, didn't they? A. Yes, sir.

Q. Had the bleacher during the last two or three years?

A. Yes sir.

Q. Now, when you made these samples of the different flour, and took it to your home and baked it into bread, the odor, you said was—I believe you said "disagreeable"? Was that the word you used? A. "Disagreeable".

Q. Very much so? A. Very much so.

Q. What did it smell like?

A. Well, I don't believe I can describe the smell.

Q. Was it offensive?

A. It was offensive to me, and to my wife.

Q. Offensive to everybody who would smell it?

- A. Everybody who was in the house. Nobody but my wife and I were there.
- Q. Now, it is true, is it not, that the other mills in Kansas who have put out bleached flour, the last two or three years, branded it "bleached", haven't they—indicated right on the bag that it was bleached, didn't they?

A. I never saw a sack of flour in my life where it said it

was bleached on the sack.

Q. Isn't it true that bleached flour, in Kansas, now, is so labeled?

A. I don't believe it is,

Q. It was well known in your town that those mills were bleaching, wasn't it? A. I believe it was.

Q. Known to everybody? A. No.

Q. It was a matter of common knowledge, in your town, that the other mills were bleaching, and that your mill was not, wasn't it?

918 A. No.

Q. Didn't you just say it was?

A. Well, it was generally known among the business men, that the other two mills bleached flour, and that we didn't.

Q. All right, it was generally known among the dealers, there? A. Yes.

Q. Now, if this other flour, when baked, gives off such an offensive odor, and your unbleached flour doesn't, how does it come they continued in business, when they could get your unbleached flour?

A. Well, sir, they sold their flour outside, like other mills who bleach flour.

Q. Don't you sell yours outside, too?

A. We sell ours outside, but we control the Wellington trade—the bakers and merchants.

Q. And yet your trade, last year, ran down from 11 to 12 hundred barrels a day to 900 barrels a day?

A. It wasn't because we couldn't sell the flour. It was because we couldn't get the wheat.

Q. How was their trade? Do you know?

A. Same way. We ran more than either one of the other mills.

Q. If this bleached flour gives off such an offensive odor, couldn't the housewife discover that? A. Mine did.

Q. How long do you think a housewife would continue to use flour that gave off an offensive odor when she baked bread from it?

A. Well, some people don't take any notice of that;—I judge they don't.

Q. Well, this odor was so offensive and disagreeable that they couldn't help but take notice of it?

A. There's quite a difference in people. There's quite a good deal of catarrh in this country.

Q. Don't you think that an odor that would be offensive to some people, might be agreeable to others?

A. I don't know about that.

Q. What is your judgment about that? All people don't have the same taste that you have? A. No.

919 Q. Then don't you think that an odor that might be offensive to you, might be agreeable to some people?

A. Yes.

Q. And don't you think that an odor that was agreeable to you might be offensive to some people? A. Yes.

Q. Well, then, an odor that you might regard as disagree-

able, other people might regard as pleasant?

A. I couldn't say as to that,

Q. Well, you might think bleached flour was disagreeable, and others might think it pleasant? A. Yes, possibly.

Q. That's a matter of taste? A. Yes.

Q. So that something that smells good to you, might smell bad to somebody else?

A. That's the case to some extent, I presume.

Q. We don't all have the same idea of what is an agreeable odor, any more than we have the same idea of what is an agreeable taste? A. Oh. no.

Q. Some people like to eat certain articles of food, or certain fruits, that other people don't like at all, and what might be an agreeable taste, to me, it might be you wouldn't like, at all? Isn't that true? A. Yes.

Q. And an odor I might think was agreeable, you might

think was disagreeable? A. Yes.

Q. And an odor you might think was agreeable, I might

think was disagreeable? A. Yes.

- Q. So, the odor of bleached flour, if there is a difference between it and unbleached flour, you might not like the odor of the bleached flour, but your neighbor might like it? Is that not true?
- A. Well, they might, but they didn't tell me that. The bakers, there in Wellington,—they don't tell me they like it, either.
- Q. Well, how does it come they use the bleached flour, then, when they can get your unbleached?

A. They don't use it, in Wellington.

Q. What is the capacity of the other mills?

A. The Aetna is about 1200 barrels, and the Wellington mill is about 500.

Q. What one is 1200? A. The Aetna,

920 Q. That's as big as yours? A. Practically so.

Q. Does it keep it up?

- A. They haven't run much, the last year or two, or three years.
  - Q. You have put them out of business, haven't you?

[Q.] We haven't done it; no.

Q. Now, you sampled that and tested it on three occasions?

A. Yes.

Q. And that's the only experience you ever had in testing them? A. That's the only experience.

Q. And in each test you concluded that you preferred the unbleached flour? A. Yes.

Q. Because of the odor?

A. Well, I didn't think it improved the patent flour.

Q. No?

A. While I don't like the odor, I don't think it made any improvement.

Q. Well, what other difference could you notice, when you made the bread out of the bleached flour, and when you made it out of the unbleached, that made you think it was inferior? Now, what else?

A. I don't think the color was as nice.

Q. You don't think the color was as nice? Now, what was the difference in the color?

A. The loaf from the bleached flour had an asby appearance, while the loaf from the unbleached flour had only a slight, creamy color.

Q. That difference was noticeable? A. Oh, yes.

Q. Any woman that was a baker, accustomed to baking her bread, could see that? A. I think so; yes.

Q. Now, don't you think there might be different tastes on that, as there might be difference in what odor we like?

A. Well, I hardly think as much as you would infer from the fact that bread sells as much on its taste as anything else, and, in fact, more so.

Q. And if the taste doesn't satisfy me, I won't take it?

A. You won't eat it if it is placed on the table. Q. Now, the taste in this,—was that noticeable?

A. Oh, yes.

921 Q. There was a difference in taste? A. Yes.

Q. Markedly noticeable? . Yes, to me. I could tell it.

Q. Then if a person didn't like the taste of bleached flour, they could easily determine it from the other?

A. I think so.

Q. Then the mill which was making the bleached would go out of business? A. Not necessarily.

Q. Well, they don't buy the flour?

A. In some markets, in some parts of the country.

Q. If the odor is offensive, and the taste is disagreeable, he can't sell his flour, can he? A. He does sell it.

Q. If people thought the odor was bad, and the taste was bad, they wouldn't buy it, would they? A. Why, yes.

Q. When they could get your unbleached flour?

A. We are not the only ones making unbleached.

Q. No, but if the odor is bad, and the taste is bad; they wouldn't buy the bleached flour, and the mill who didn't bleach [it] flour would get all the trade?

A. I didn't say the odor was bad to everybody. I said it

was bad to me.

Q. Oh. Is it bad to other people? A. I don't know.

Q. Other people might like it better than yourself?

A. Yes; might be.

- Q. You are not prepared to say but what other people would prefer the taste of bleached flour?
  - A. I am not prepared to say; no. Q. You simply say you didn't like it?

A. Yes, sir. And many of your acquaintances don't.

- Q. Everybody in Wellington uses the bleached flour, do they? A. Not everybody.
  - Q. Yet they could all get yours, if they wanted it, couldn't

they? A. Yes.

Q. Now, you are making patent flour, there at your mill?

A. Yes.

- Q. Branded as such? A. Yes, sir.
  - Q. And you put in how much? A. 75 per cent.

922 Q. Always 75 per cent?

- A. Well, it runs from 73 to 75. I might say 72 to 75. It varies a little, there.
- Q. Didn't you say that a patent flour would contain 80 per cent of it?
- A. In some instances, where the conditions are favorable—atmospheric condition, and the wheat in good shape, you know—good grade—about 80 per cent.
- Q. As a matter of fact it does depend upon the quality of the wheat, and the mill, and the miller, and the atmospheric condition, and a great many influences influence it, don't they?
- A. It depends on the mill and the miller, from 80 per cent down.
  - Q. Now, do you know of any two mills that make the same?

A. Oh, yes; yes. O. What two?

- A. Well, the Aetna Mill, there, for years, and myself, made a 75 per cent right along. We made 78 per cent there two or three years.
  - Q. Each running 78 and 80 per cent, at the same time?

A. I don't know exactly.

Q. Now, as a matter of fact, you don't know of any standard that has been fixed by the Government, or anybody else, saying what constitutes patent flour?

A. No, custom has made the only standard.

Q. Now, in making your patent and your straight, is there any difference in the color? A. Oh, yes.

Q. What is the difference?

A. The straight, in the dust, it is slightly whiter than the patent.

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Q. That is, if we take a sack of your straight flour, it would be whiter than a sack of your patent flour?

A. Slightly whiter; yes.

Q. Slightly whiter? So, if a person was looking for white flour, and looked at your two sacks, they would take the straight flour, as the whiter,—whiter than the patent? Is that right? A. Yes, sir.

Q. And if they were going to determine of the value of the flour by its color, they would pick out the straight?

A. Whiter in the dough, but not the dust.

Q. No, but when they went to buy it, they would have it in

a sack? A. Yes.

Q. If I went to the grocery, and they had some Hunter Mills flour, there, and the man would say, "Here's two sacks of flour, one straight and the other patent", the straight would be slightly whiter? A. Slightly whiter.

Q. So, if I took the color, as to whiteness, as being an index to the character of the flour, I would pick your straight

flour, as being the best, wouldn't I?

A. Probably would; yes, sir.

Q. So, if color, as to whiteness, is an index of the value of the flour—

A. (Interrupting) No.

Q. Now, wait until I get through with my question. If color is an index to the character of the flour, and whiteness is one of the things which indicate it, I would pick your straight as being better than your patent, because it is the whiter?

A. Color isn't an index to its value.

Q. All right; let's get at that. Then color is not an index to the value of flour? A. It is one of the indexes.

Q. All right; it is one of the indexes. Then, if I went to the grocery store to buy some of your flour, and regarded color as one of the indexes, I would pick your straight flour as being better than your patent, because it is whiter?

A. If you depended altogether on the color, you would.

Q. Could I tell any difference in the granulation of your straight and your patent flours, if I just took it in my fingers?

A. I don't know whether you could, or not; I can.

Q. Well, you are an expert miller, but let's take an ordinary person, who buys one or two sacks of flour a week, or month, possibly. A. I doubt it.

Q. Could they tell it, by feeling with their fingers?

A. I doubt very much whether the ordinary man could tell the difference.

924 Q. But, as an ordinary man, I could tell the difference in the color, couldn't I?

A. Any flour man, or any baker, or merchant could.

Q. Well, but where we have got a few millers and bakers and flour merchants, we have got hundreds of us people who buy it and pay for it? A. Yes.

Q. We couldn't tell the difference in the granulation?

A. Between the straight and the patent, I doubt very much.
 Q. But I could tell the difference in the color? A. Yes.

Q. Then how else could I, going into a grocery store, tell which is the better?

A. Well, you would have to have a miller's drier.

Q. Well, there aren't very many of us who carry a miller's drier around with us in our trousers pockets; but, if I went to the grocery store, and saw your two flours there, and I felt of them, could I tell which was better, and which was the superior flour, by that? A. I don't believe you could.

Q. If I looked at them, I would see the straight was

whiter?

A. You would have to have a miller's drier, and smooth them out.

Q. Well, unfortunately the most of us don't carry them around with us, but, if I looked at them, I would see your straight was whiter than your patent?

A. I don't believe you could tell, by looking into the sack.

Q. Haven't you said your straight is whiter than your patent? A. It is slightly whiter.

Q. Then what is there in those two flours, that would indicate to me, as a consumer, which is the superior flour?

A. Why, you would have to go and—As a consumer, I don't believe you could tell anything about it.

Q. All right; we have got that. Then, what has a consumer, then, to go by, if you couldn't tell anything about it by looking at it, as to which was superior?

925 A. If you ever saw a miller smooth out two flours, and compare two flours in the test, you could take that drier

and tell the difference.

[A.] Well, I don't suppose there's one out of ten thousand of us that ever did that; but I want to know, now, could a consumer,—a housewife, or the head of a family,—in going to a grocery store and seeing your two flours,—could he tell by the looks of them, which is the superior?

A. That would be a hard question to answer.

Q. What is your judgment as to whether he could or not?

A. It would depend on whether they had ever been about a mill, or whether they had ever talked with a miller, or whether they had ever seen two flours smoothed out that way.

Q. Well, you know, the average housewife never spent very

much time around a mill?

A. When a man goes into a grocery store to buy a sack of flour they don't open up the sack and look at the flour.

Q. I think that's true. They don't look at the flour and compare one with the other? A. No, sir.

Q. They don't examine the flour?

A. They don't open the sack.

- Q. They buy it from the representations of the grocer, don't they? A. Yes.
  - Q. And the color,—that cuts no figure? A. Why, no.
  - Q. They never examine the color? A. No, sir.

Q. They never examine the texture? A. No.

Q. They don't open it up? A. No, sir.

Q. They buy it, wholly on what the grocer says, and the color, in the language of the street, "cuts no ice"?

A. No.

- Q. Well, I guess not. Do you treat your flour, at all, in order to color it? A. None whatever.
- Q. Do you have any sort of a treatment that you give your wheat? A. I temper my wheat in the ordinary way.

Q. What is that for?

A. It is more particularly to toughen the bran, and get 926 the bran in condition that I can mill it out, and mill the flour off of it.

Q. Don't you treat your wheat with a treatment of hot air, or something, in order to lighten the color of the flour?

A. I first use water on my wheat, and then use heat to dry it out.

Q. And don't you do that for the purpose of whitening the flour?

A. That puts the wheat in shape so that the flour is whiter.

Q. And you do that for the purpose of whitening the

A. That is one of the essentials of milling that has been in practice for years.

Q. Why? In order to color the flour and make it whiter?

A. It plays an important part. The whiter the flour, the whiter the loaf, and we want it that way, as near as we can get it in its natural state. Moisture to wheat is natural, and heat to wheat is natural.

Q. Instead of our electrified air, you use hot air, in order to whiten it, don't you? A. We just use heat.

Q. You heat it with hot air, don't you?

A. Well. I don't know; there isn't much air in there.

Q. Well, how do you heat the wheat, without heating the air? A. There's heat in those heaters.

Q. Now, that is before or after the wheat is ground?

A. Before it has ever touched the rolls.

Q. You heat the wheat, do you? A. Yes.

Q. And that heating process is done by hot air, is it?

It is done by steam.

All right. Then you heat your wheat, and one of the purposes that you have in view, in doing it, is to whiten the flour, isn't it?

The steam is not applied to the wheat. It is the heat A.

from the steam.

927 Q. All right. Then the heat from the steam is applied to the wheat for the purpose, among other things, of whitening the flour isn't it? A. Yes.

Then that is the way you bleach your flour. Q.

We don't call that bleaching. That isn't bleaching. A.

Oh, no,-no,-of course not; but you use that process to whiten the flour artificially, don't you?

A. Well, not altogether. Q. Not, not altogether?

We use it for putting it into the condition, so we can grind it as we think best to produce a good color and better granulation.

What do you mean by "good color". Q.

Whiter color: of course.

## Redirect Examination.

By Mr. Butler:

Q. Describe this process that Mr. Smith referred to hot air, awhile ago, and tell us whether or not it is one in common use, how long it has been in common use, and what it is for? Was that used before Mr. Alsop introduced his modified air?

A. I have been acquainted with the system of tempering for 40 years or more. I don't believe Mr. Alsop had a bleacher on the market then. We clean our wheat. That's the first requisite in good milling, is good, clean wheat, and we put that through separators and scourers. Then we run into a conveyor, into which we run water, and that wheat is thoroughly blended with the water, so that every grain gets some of the moisture. We let that wheat stand in metal bins, 3 to 5 hours. We draw it from there, then, and run it into wheat heaters, consisting of a cast iron or copper case with tubes running down through the center, and the steam comes inside the case, comes in contact with the tubes. The tubes are small, and the wheat lays down over the tubes, and they

are so constructed that it keeps turning the wheat, and 928 gets the heat to every grain, and draws that moisture out again. That water going in there and coming out, leaves the bran in a toughened condition, so that the bran will not-so that it will pulverize the least. The other way, ordinary, dry wheat bran will powder up and make flour out of bran, looks like bran, is incorporated in the flour: but, by

putting it in this process, we prepare that bran in such shape so that we can break it open and take the flour, and middlings off of it without pulverizing so much of this branny substance.

Q. Any chemicals used? A. None, whatever.

Q. Anything besides heat, and what else?

Water. Water first. A.

Q. How long does it take to get this sweat in the heat?

I judge from 3 to 5 hours. A.

- Now, how does that change the color of the flour? Q.
- That enables us to make the flour whiter. A. By enabling you to keep the bran out of it? Q.

By enabling us to keep the bran out of it. A.

Q. Now, is this tempering of wheat one of the steps in the milling process?

It is one of the important steps, and has been for forty

vears to my certain knowledge.

Q. Practiced, so far as you know, by all millers, everywhere?

A. Yes, sir: whether he has any bleacher, or not, he tempers his wheat.

Q. Now, Mr. Smith asked you if you know of any other mill that made a 75 per cent patent, or 80 per cent patent. Do you know what the truth is, now, with respect to the Aetna Mill, at Wellington?

A. Well, of course, those mills, there, and myself, are associated, every day, and talking together over the mill,-

Mr. Smith: Well, I object to him telling what the Aetna milling people tell him, as hearsay, and incompetent.

The Court: Objection sustained.

By Mr. Butler:

Q. You don't know, of your own knowledge? 929 A. I don't know, of my own knowledge; no, sir.

Do you know what they did with that clear that they bought from you?

A. Mixed it into their 95 per cent. Blended it with the 95

per cent.

Q. They were bleaching, at that time, were they?

Yes, sir. A.

Q. Do you know what brand it went out under? A. "Aetna Silk". That's the only one I ever saw.

Did that brand also contain the word "high patent"? Q A. Yes, sir.

I intended to ask, in direct examination, whether you are familiar with the hard, turkey wheat, in Kansas?

A. Yes, sir.

Q. Something was asked one of the other witnesses, in cross-examination, as to the grades of that. I would like to have your knowledge on that subject?

A. I have seen No. 1 turkey quoted.

Q. Well, is there in the market, generally, a No. 1 turkey

or is it a No. 2, the highest turkey?

- A. If there has been any establishment of that grade it was done the past winter. I saw letters in our office with the quotation of No. 1 turkey.
  - Q. Well, if there is any No. 1, then, it is very recently?

A. It is of very recent date and establishment.

Q. And, usually, this No. 2-

A. (Interrupting) No. 2 is generally the high grade wheat.

Q. Now, you are familiar with this wheat that is sometimes found in the turkey hard wheat, in some parts of Kansas, and some parts of Nebraska, called the "yellow berry"?

A. Oh, yes.

- Q. What kind of wheat is that?
- A. It is a deteriorated turkey wheat.
  Q. A deteriorated turkey? A. Yes, sir.
- Q. Is it, by millers and dealers, considered objectionable in wheat?
- A. Yes, sir, although we mill it right along, we would rather have the turkey wheat.
- Q. Have you been able to observe, from your experience, any difference in the flour produced from the yellow wheat, and the turkey wheat—I mean the turkey wheat that it grows with and among?

A. The dough mixture, where it is all yellow berry, the flour is generally softer, and more creamy, than the hard

turkey.

Q. Are the flours as light colored as the hard turkey?

A. Isn't as white.

- Q. Have you had experience or observation enough with these bleachers, to tell whether the flour of the yellow berry, after bleaching,—is that like the flour of the turkey hard wheat, or other wheat?
- A. In this way, I am,—a grade with about 65 to 70 per cent of yellow berry, mixed with 30 to 35 per cent turkey.

Q. Now, how did bleaching work on that?

A. Well, as I have stated.

Q. It made it whiter? A. Made it whiter,

Q. Now, let me ask you, how much yellow berry was there in that flour?

A. Well, during that time, I think we run about 30 to 35 per cent turkey, something like that. There was some turkey here in Kansas, then, just as there has been in Kansas for the last three years. There is more turkey in this crop than we have had for quite awhile.

Q. The flour that you took to make these baking tests, did you make it from turkey hard wheat, mixed with yellow berry?

A. Mixed with yellow berry; yes.
Q. Now, about the proportion of each?

A. About 70, 65, somewhere—from 65 to 70 per cent of the yellow berry.

Q. Of the yellow berry?

A. Yes. We haven't had anything else to mill with in Kan-

sas for a good many years, except yellow berry.

Q. Now, how much yellow berry runs through the turkey hard wheat—that is, in the wheats that are found in these parts of the country, this year?

A. Well, it varies, now; in some localities, we get cars of wheat that it is pretty hard to find a grain of hard

turkey.

Q. It is all yellow berry?

A. We may get, the next time, several cars that will show possibly 50 per cent turkey, and it will range in there, from practically nothing, to 50 per cent.

Q. Of turkey? A. Yes, sir.

Q. That is,—do I understand that there is a larger proportion of the yellow berry,-than the stuff that isn't yellow berry? A. Oh, yes.

Q. So, within 10 to 30 per cent of yellow berry, would

be rather favorable situation, on the present market?

A. We would be glad to average 20 per cent. Very glad to average 20 per cent straight red turkey wheat.

Q. 20 per cent of red turkey? A. Yes.

Q. So, your experience is, it runs about 80 per cent, then, of yellow berry?

A. Yes. Well, that is the way we make it. Right in our

locality it will run, as you said, from 10 to 30 per cent.

Q. Well, can you find wheat to mill as low as 10 per cent to 30 per cent, yellow berry? A. How's that?

Q. Can you find wheat to keep your mill going, as low as

10 to 30 per cent of yellow berry?

A. We have always been able to, so far. That is, down to 30 per cent of yellow berry?

Q. Yes.

A. No. I mean down to 30 per cent of turkey, and the balance of yellow berry.

Q. So the best you can do is 70 to 80 per cent of yellow

berry? A. Yes, sir.

- Q. Do you know whether the yellow berry is as prevalent in Nebraska as it is in Kansas? A. I do not.
- Q. You wouldn't be able to compare the situation at Wellington, Kansas, with that at Lexington, Nebraska?

A. No, sir.

Q. Now, was this odor and flavor that you spoke of, due to the yellow berry? A. Well I don't know.

Mr. Butler: I thought Judge Scarritt intimated some-932 thing like that, when you mentioned the yellow berry. I thought I heard him say "no wonder he had bad bread."

Mr. Helm: Judge Scarritt hasn't been on the stand.

Mr. Scarritt: I haven't said anything of that kind.

Mr. Butler: I thought I heard you say that.

Q. Now, was there about as much yellow berry in the flour that was bleached, as in the flour that was unbleached?

A. Yes.

Q. It was the same wheat that made them?

A. All made out of the same wheat, at the same moment, you know; just took one sack after the other one.

Q. What was it,—a clear, or a straight, or a patent?

A. A patent flour.

Q. 75 per cent? A. Yes.

Q. How large a place is Wellington?

A. About 7,000.

Q. And the milling capacity of the town is about what?

A. 12, and 15,—27, and 5. About 3200.
 Q. About 3,200 barrels a day? A. Yes.

Q. So the milling capacity somewhat exceeds the consum-

ing capacity? A. Oh, Lord! yes.

Q. So the fact that you gave Mr. Smith, in cross-examination that, down at Wellington the merchants and people down there, for the most part, use the flour from your mill, didn't necessarily indicate that the other mills couldn't find any market for their flour, did it? A. No.

Q. One of the principal industries is shipping out, to the

world, I suppose? A. Yes.

Q. To all parts of the country, and world, perhaps?

A. Even all the home trade is an infinitesimal part of ours.

## Recross Examination

By Mr. Smith:

933 Q. Is there any wheat sold in your market, in your vicinity, by the carload, that grades No. 1 hard?

A. No. We never grade it that way.

Q. The first grade wheat known on the market, down there with you is what grades No. 2, isn't it?

A. No. 2; yes.

Q. Now, the No. 2, as you buy it, there, at the mill,—and that is the first grade of wheat that you can get,—contains, as I understand it, about 75 to 80 per cent of yellow berry?

A. Our wheat will average something like that.

Q. Yes, that's what I mean. It averages about 75 to 80 per cent of yellow berry?

A. Some years, and some years less.

Q. And the balance of it would be turkey red?

A. Yes.

Q. Now, that grows in the same wheat field, don't it?

A. No.

Q. Don't you understand that turkey red-

A. (Interrupting) Of course, turkey red,—you sow turkey red, and in two years,—the second year you sow it,—then, a great part of your wheat—a good big per cent of it will be yellow berry, and the next year, you will have—

Q. (Interrupting) It is true that, in the first year, there will be, in the heads of the wheat, some kernels of what you would call turkey red, and some other of yellow berry?

A. Yes.

Q. So it all comes from the same seed? A. Oh, yes,

Q. So, with the grain used in your mill, you would have as high as 75 per cent of this yellow berry, to 25 per cent of the turkey red? A. Yes.

Q. And you make your highest grade flour from that, don't

you?

A. Of course, that is an estimate.

- Q. Oh yes; I don't mean to say exactly, but that is about it? A. Yes.
  - Q. And it is from that you make your patent flour, isn't it?

A. Yes.

Q. And you make as good flour as any man on earth, don't you? A. I don't know about that.

934 Q. Well, you think you do, don't you? You believe you do, don't you?

A. We sell it, all right.

Q. You are not prepared to admit that there is any miller on earth that makes better flour than you?

A. Well, I don't know about that.

Q. You wouldn't like to? You don't admit it on the trade, do you?

A. No. I have been there 11 years, and I never milled a carload of straight turkey hard wheat.

Q. And no other man ever did, anywhere. And the best that he gets on the market, and the best that goes on the market, is a combination turkey red and yellow berry?

A. Yes.

Q. There's no use wasting any time on that, is there, or trying to get away from it, is there? A. No.

Q. What's the names of your flour?

A. The patent flour is "Hunter's Cream".

Q. Does it have the word "patent" on it?

A. Yes, sir.

Q. And what's the name of your straight?

- Straight, is "Hunter's Upper Ten". That has had the word "patent"-just the word "patent" on it, until the last few months. The last carload of bags that was ordered, that was ordered stricken off.
- Q. How many years did you have "Hunter's Upper Ten" labelled as a "patent" flour?

A. Oh, the brand is only about 5 years old.

Then you used it for about four years, did you? Q.

Yes. The old [bran] didn't have it. A.

- Then for four years, "Hunter's Upper Ten" went to the trade with the word "patent" on it? A. Yes.
  - Q. How recently did you cut off the word "patent"?

I don't know just when it was-possibly a year ago we ordered the word "patent" stricken off.

But for four or five years before that, "Hunter's Upper Ten" contained the word "patent"? A. Yes.

Q. And that was your straight flour, wasn't it? A. Yes.

And that straight flour contained what per cent of the entire flour content of the wheat?

A. 95 to 97 per cent.

- 935 Q. 95 to 97 per cent? So, for four or five years, "Hunter's Upper Ten" contained from 95 to 97 per cent of the entire output and went to the trade as a patent flour, didn't it?
  - Yes. What little we made of it. We didn't make much. A. Yes? Now, what's the name of your clear flour? Q.

A. It is branded "Fancy Clear".

Q. Did it have the word "patent" on it? A. No, sir.

O. Left it off of that? A. Yes, sir.

And that's what is left, after you get out that certain percent of patent, now? A. Yes, sir.

But there wasn't anything cut out when you made the "Hunter's Upper Ten", and labeled it "patent", was there, except the red dog? A. No. sir.

What do you say about "red dog". Do you sell that as

A. We don't make any red dog. flour?

That is, you run the red dog in with the bran and shorts? A. We don't make any red dog. Just white flour. Well, you don't even cut out any red dog, in yours?

A. No. sir.

Then, when you get your clear, that even included the red dog, didn't it?

No. sir. We cut the low grade out. We don't make any red dog, I tell you.

Q. Well, you said it is flour? A. Red dog ain't flour.

Q. Well, that which other millers would denominate as

"red dog", you ran in with your bran and shorts?

A. That is, we made a sifting out of the dust that is in the shorts, or red dog; we let that go with the shorts. We don't designate that "red dog".

Q. Are there any dealers in Kansas City who handle your

flour, now?

A. No, sir, except the Kansas Milling & Export Company. I don't know whether they have any of it on the market, here, or not. I sell them a great deal of flour.

Q. The Kansas Milling & Export Company?

A. They own their own brands.

936 Q. How do they brand it?

A. Their best is "Nobility". That is their patent. Their straight grade is "Integrity", and the clear is "Stability",

Q. Either of these labelled "patent"?

A. I don't think the word "patent" is on any of them, unless it is—no, I don't know of any.

Q. Does the tag show it is made by this firm?

A. Yes, sir.

Q. So, if we can find any flour that is named "Nobility", or "Integrity", or Stability", that would be your flour?

A. Oh, no.

Q. That would be flour made at your mill?

A. Oh, no. The Kansas Mill & Export Company puts other flours under the same brand, from other mills.

The Court: They brand it that way, regardless of where it comes from.

The Witness: Yes. Kansas Mill & Export Company is the name of the dealer. That is, not the dealer, but the broker, here.

By Mr. Smith:

Q. They have flour from different mills, and brand it this

way? A. Yes.

Q. But, if we can find any of "Hunter's Upper Ten", or "Hunter's Cream" or "Fancy Clear", that is made at your mill? A. Yes, sir.

Q. I would like to have you make it a little more clear

about this "red dog". You make none of that at all?

A. No, sir.

Q. Now, sometimes, that which is left, after the straight, or the clear,—the low-grade flour—that is sometimes called a "red dog"? That seems to be the truth, as established by the testimony of a great many instances? A. Yes.

Q. Now, what I am trying to get at is,—are the names "red dog" and "low-grade" applied to the same thing, or is "red

dog" that which results from different methods, separate and distinct from the low-grade?

A. Now, the way I mill, and the way a number of mills run that I know of, they make about 44 pounds of flour to the bushel

-43 to 44 pounds, and we make a low-grade flour, that constitutes about 1 & 3 tenths to 1.4 out of that amount.

Now, a great many mills go on and mill their shorts down closer, and make a flour in between the shorts and our low-grade, that they call "red-dog". That's a part of milling that I don't know of any Kansas Mill that has taken any notice of. They do that in the North a great deal. They mill it as long as they can get anything that has any resemblance to flour, or even, still what they call "White Shorts", in the North, that we don't make, at all. We make one grade of shorts.

Q. (Exhibiting to the witness a bottle) Now, I have brought in here something that was furnished me, different milling products and, among the things when I opened the case to the jury, I used that stuff in the bottle, marked "red dog", as an illustration of "red dog". Now, is the name "red dog" usually applied to stuff about like that? That's what I am getting at. A. Yes.

Q. And when it is so milled that it comes out as low-grades, what is its appearance, as compared with flour, that is called

a clear, I think, on that?

A. It is nearer the color of that.

Q. That is, it looks like flour?

A. Yes, sir. The two, compared together, would be slightly—

Mr. Butler: (To the Jury) You probably will hold in mind what this "red dog" looks like. Now, we have nothing called "low grades" here.

The Witness: I have a sample of low-grade, right out there.

Q. Is that a sample of low-grade you produce?

A. Yes. No, I gave that to Mr. Winslow, I believe,—didn't I.

The Court: Is Mr. Winslow present?

(No response.)

The Witness: I believe it is in my grip, out there.

The Court: We will take a very short recess.

Recess taken as ordered, after which the witness Barnard resumed the stand, and was questioned further, as follows:

938 By Mr. Butler:

Q. You were not able to find your sample of low-grade, that you had, here? A. No, sir.

Q. You gave that to Mr. Winslow, and he is not about?

A. No.

Q. Now, with respect to this "Nobility", "Integrity", and "Stability" brand. As I understand that situation, you furnish flour to some merchants, here, in Kansas City, or dealers, or brokers,—something like that?

A. They are more of brokers. There is a company here

that's called the "Kansas Milling & Export Company.

Q. Kansas Milling & Export Company? A. Yes.

Q. And they furnish you the sacks? A. Yes. Q. And your name doesn't appear, at all?

A. No. My name doesn't appear on the sack.

Q. Now, you say that finding flour with those names on it wouldn't indicate that it was your flour, at all?

A. No.

Mr. Smith: I so understand.

Mr. Butler: Well, I wanted it to be perfectly clear about that.

Q. They might make similar arrangements with a dozen mills? A. Oh, yes. They do.

Q. And it might just as well be the flour of Mr. Leflang, of the Lexington Company? A. Yes.

Mr. Smith: Yes. That's what he said.

By Mr. Butler:

Q. It might be bleached, when your mill never bleached a pound? A. Yes.

Mr. Smith: There's no question about that.

Mr. Butler: Well, I wanted it to be clear, because that flour might turn up with a bad name, some place, and I don't want to blame the Hunter Milling Company with it.

The Court: I so understood.

939 Mr. Smith: Oh, yes; I want to be fair with the witness.

# Recross-Examination

By Mr. Smith:

Q. I want to ask you, Mr. Barnard, if there is any broker, here in town, that handles your flour in the bags as you put it up? A. No, sir.

Q. Is there, in Kansas City, Kansas? A. No, sir.

Q. Where would I find a broker who handled that flour?

A. Not in Kansas City, at all,—either one of the Kansas Cities, or retailer, either.

Witness Excused.

George Freeman, called as a witness on behalf of the Government, being first duly sworn, was examined, and testified as follows:

### Direct-Examination

By Mr. Butler:

Q. What is your residence? A. Kalamazoo, Mich.

Q. What is your age? A. 33.

Q. And your occupation? A. Baker.

A. What experience have you had as a baker?

A. Well, I have been in the baking business ever since I was 13 years of age.

Q. Where.

A. Served my apprenticeship in England, and served my improvership—

Q. What is that? A. An improvership?

Q. What is it?

A. You serve three years as an apprentice, and you 940 learn all there is in that shop, and when you know all there is in that shop, and your time expires, you are at liberty to leave or to stay on. Then, I went and served improvership, by working a year at the best shop that I knew of.

Q. What place? A. Birmingham.

The Court: England?

A. Birmingham, England. And then, if you take an improvership, you work at very reduced wages, you know, at just slightly over the —For instance, in the apprenticeship I served, I put 10 lbs., or \$50.00, down—

Mr. Smith: If your Honor please, I don't think that is material. Let's get down to the meat of the thing.

Mr. Butler: It don't hurt you.

Mr. Smith: No, it don't.

Mr. Butler: I think if he paid to learn, it is different from working to earn.

Mr. Scarritt: He would know just as much about it, either way.

Mr. Butler: Oh, it don't hurt Alsop's process any, to have this gentleman tell his experience.

Mr. Smith: No, it don't hurt the Lexington flour for him to detail his experience from infancy up.

The Court: I thought you gentlemen were all tired, but I guess I was mistaken.

Mr. Smith: I am tired, your Honor.

Mr. Butler: Yes, and that's the reason you are objecting. If you weren't tired, Mr. Smith, you wouldn't be objecting to it.

The Court: Well, let's go on.

The Witness: (Continuing) I served my improvership at reduced wages, for the purpose of learning all there was of the different things in the other bake shop,—the treatment of the flour, the fermentation,—

941 The Court: You staid there a year?

The Witness: I staid there a year, at reduced wages-

Mr. Smith: Well, that's very material, I guess.

The Witness: (Continuing) And I went and took a position as a mechanic. I worked as foreman of a shop, when 19 years of age.

The Court: Baker shop?

The Witness: Yes. Then I came to America in 1896.

The Court: Been here 14 years?

The Witness: Yes, sir.

By Mr. Butler:

Q. What experience and study have you had in this country, along the lines of baking wheat flour into food products?

A. I worked in the bake shop until 1900, and in 1900 I went to the Chidlow institute, in Chicago.

Q. That is an institute where is taught the science and art

of baking?

A. Yes, sir. Then, since then, I have been foreman of the Morton Baking Company, in Detroit. I was foreman for the National Bread Company after that, and since I left Morton's, I was a year with Whittleberger, another bake shop in Detroit. Then, three years ago, I came to Kalamazoo, where I went into business as an active partner with two more gentlemen, with a concern known as the Whitwear Baking Company, where I am, at present.

Q. And what is the size of that concern?

A. Our output varies from to 10 to 15 thousand loaves of bread a day, or, we use a carload of wheat—a good carload.

Q. Have you studied different kinds of flour?

A. Yes, sir. I commenced studying flour, when I was about

a year and a half in the business.

Q. Will you describe the qualities, or essential characteristics of flour, which affect the bread-making qualities of the same?

A. Certainly. Would you kindly repeat your question?

Q. I would like to have you describe the essential qualities of flour, which enter into the determination of whether or not it is a good flour for bread-making purposes?

A. A good flour should contain, as a foremost consideration, a good amount of gluten, of a high quality

gluten, which will give it strength, and water-absorbing capacity, and capable of expanding for a big volume; as will make it expand, and make a big loaf, with a very close grain, or even texture. Second, would be the flavor.

Q. Of the flour?

A. Of the bread made from the flour. That would be a requisite in the flour, to produce good flavor, and, third, would be the color, or, rather, I would rate it as, first, flavor; second water-absorbing and expansive ability, with even texture; and third, color of the flour; and I would write their values, or estimate their values, in the order as I have named them.

Q. That is, you would rank flavor as the most important

consideration? A. Yes, sir.

Q. And then the elasticity? A. Yes, sir.

Q. That depends upon the gluten—the quality of the gluten?

A. Yes, sir.

Q. And amount, also? A. Amount and quality.
Q. And, last in importance, you would rate color?

A. Color.

Q. Now, as to quality of gluten. Are you familiar with the location and place that gluten, of different kinds or qualities, is located, in the same wheat kernel?

A. Yes, as close as can be got by our present-day milling

processes.

Q. Now, describe that, taking the kernel of wheat, and describe the gluten, where located, and quantity, and quality?

A. The gluten, of course, is the protein of the wheat, and bears the same relation to the wheat that the lean does to the meat—to beef, or mutton, or anything that way. The carbohydrates and starch, have the same relation as the fat of the meat. Now, wheat is practically the only thing containing what we call "gluten". What is known as "gluten". It is the only vegetable substance that we have, that contains it, and that is made up, according to its quality,—made up of gliadin

and glutenin. In the gluten of the wheat, they have a ratio of about 50 per cent gliadin, and 50 per cent glutenin. The gliadin is the soft, springy elastic part of the gluten, which, if you catch hold if it, and pull, it would stretch very long. You could stretch it out perhaps six or eight inches, or more. The glutenin is what we regard as the inferior quality of the gluten. So, nature,-according to where we can get it; as near as we can get it, from our present-day milling methods,-what we call the "middlings patent", is improved middlings, because it is from the middle of the wheat, or the closest to the germ. The middlings of the wheat, of the whole berry, are the closest to the germ, and the nearer you go to the germ, the higher the ratio of gliadin to glutenin, in this gluten. The further you go-the nearer the bran you get, the higher the ratio of glutenin to gliadin. In other words, nature planted the best quality, or the most easily digestible part of the gluten, the closest to the germ, of course, when it was in the soil, to commence germination, and, in its infancy, to have the most easily digested part of the wheat. Well, the quality of gluten depends upon its ratio of gliadin to glutenin. Now, we find the best baking qualities of a loaf of bread, contains a ratio of two parts of gliadin to one of glutenin. will make a loaf which will give volume and nice, even texture, a silky feel. You can spoil any bread by fermenting it until you get it sour. So, if it is not over-fermented, it will make what we regard as a beautiful loaf of bread, with a nice crust, which I could best describe as an eggshell crust, thin and brittle. And that's what us bakers regard as the best loaf of bread that we can make. Now, if you turn around-Now, that flour can be obtained from what we call middlings,-from the middlings, or the central portion of the wheat berry, 60 to 65 per cent. That's why us, as bakers, demand the 65 per cent patent. As you get away from that, your proportion of gliadin to glutenin is changed. We have got a high proportion of glutenin, and a very low proportion of this gliadin. Well, that kind of the gluten containing the high proportion of glutenin, to the low proportion of gliadin,-it isn't resistant. You

to the low proportion of gliadin,—it isn't resistant. You 944 can't stretch it. In fact, it is the hard part of the wheat, and if you get that in the bread, through it being so hard, it is harder to digest during fermentation. You can't ferment it like you can the rest of it. The result is your loaf will be darker colored, because you have got the flour from nearer to the bran. It is darker colored. Your loaf will be darker colored, through not being able to ferment this stuff, properly. You have got a coarse loaf of bread, on account of its hardness. It will dry out quicker, and won't retain moisture, and the crust will be hard and [tuff], like leather. I just

describe it as leather. Most customers say the crust is like

leather. Does that sufficiently answer the question?

Q. Now, you say, as I follow you, that of the gluten there is gliadin and glutenin, and in the whole mass of the gluten, there is about half of each? A. Yes, sir.

Q. But not distributed uniformly? A. No, sir.

Q. And you will get a relatively greater amount of the gliadin about the germ of the wheat kernel? A. Yes, sir.

Q. Now, whereabouts, in the wheat kernel, is the part you

call the germ?

A. In the wheat kernel, it is about one-third of the distance from the end.

Q. Which end? A. From the end of the wheat.

Q. Well, there's one end that has a little hair-like attachment to it.

A. It is the opposite end of that. What you would say the top. Of course, the hair-like end is what goes down into the ground. That is what is called the "beard" of the wheat. It is the opposite end of the wheat.

Q. It is the opposite end, from the little beard-like processes on the one end? That's what I am getting at? A. Yes, sir.

Q. Now are you familiar with flour known as "patent flour"? A. Yes, sir.

Q. And is that an expression that is recognized in the trade, milling and baking, and in the markets—flour markets?

A. Patent flour is a flour made—should be made—represented to be made from the purified middlings, or the central portion of the wheat berry, to the extent of about

65 per cent of the total flour of the wheat. The term "patent", applied to that, to my knowledge, has been recognized ever since about a year and a half after I commenced in the baking business, which would be 18-1/2 years ago.

Q. That is, you have known it that long?

A. I have known it that long. Never had anyone to in-

terpret it as anything different.

Q. Now, as to the bread-making qualities of patent-flour, compared with the straight flour made from the same wheat. What do you say about that,—or the clear flour, made from the same wheat?

A. . The patent flour made from the purified middlings or the 65 per cent, or the most central part of the wheat berry, will make what we regard as the ideal loaf, and it is easily made into bread. If you happen to bake it a little sooner than fermentation has proceeded what is regarded as sufficiently, it will make a good loaf of bread. If you let it stand a little longer, it will make a good loaf of bread. In other words, you haven't got to get an exact point of fermentation on it. It will make a good loaf of bread even when it isn't properly handled.

The straight flour is a different thing, entirely. It is harder fermented, it stands a different fermentation, and it will make a coarse, undeveloped—what we may call undeveloped. You can't properly ferment it. That's why we call it not properly developed in the process of bread-making. The result is it will be coarse, dry, hard, harsh, tough, crust, and if you don't happen to ferment it properly—sufficiently, it will come up very slow, when you put it into the pans, and instead of standing up nice and round, like a patent flour, will, it will run over the sides of the pan. You put it in the oven, it will raise, and will, in nine times out of ten, run over the pans, into the bottom of the oven, as I have seen it, in small batches, when I have been testing the flour, time and time again.

946 Q. Now, as respects the flavor of the gluten, or the volume of the loaf, or the color. I want you to compare those qualities of the bread made from patent flour, as compared with bread made from straight or clear flour from the

same wheat as the patent?

A. They will run in the order as I have named them at the commencement of my testimony. The first patent will make the ideal loaf, with a beautiful flavor, big, and expansive qualities, with a fine texture and excellent flavor.

Q. And, compared with a clear.

A. The color, a beautiful, white, light and bright, clean, creamy white.

Q. Now, as to the degree of whiteness, between bread made from the patent flour, and from the clear, or the straight, from the same wheat?

A. Well, I could best describe that, and make it more simple, in percentages. Give, we will say, for instance, color value, from bread made from patent flour—give that 100 per cent. Straight, I would give 90, and the bread made from clear, I would give 80. That's all from the same wheat, of course.

Q. I understand you. Of course, there are variations between different kinds of wheat? A. Oh, yes.

Q. Different conditions of wheat, depending on the harvest,

and the rains, and many other things?

A. And so, for instance you mix a patent,—a patent and the clear, or the patent and the straight, you will find that it is all a matter of degree. They vary in color; so, in describing the color of that, say 50 per cent patent, and 50 per cent straight, from the same kind of wheat, the [changes] are, 99 times out of a hundred, it would be 95 per cent color value.

Q. Now, what relation has the relative amount of gliadin to glutenin, upon the flavor, volume, and color of the loaf, made

from the patent flour?

A. Well, as far as the flavor of the gliadin and the glutenin is concerned, it wouldn't effect any difference, but the percentage of gliadin to gluterin would be, in the flour that you have just described-would be changed from the description

of patent flour, in that it would be a higher per cent. I contend that the glutenin would be greater, and a lower 947 per cent of gliadin, therefore, it would stand a whole lot longer fermentation-in other words, the dough wouldn't ripen anywhere near so quick, and, therefore, it would stand longer fermentation, and the longer you ferment a dough, the nearer you get to what is called and known in the baking business as the bacterial fermentation, and the sweetness, or the soundness, depends upon the proportion or amount of bacteria that you have developed in the form of, say lactic or acetic acid. The lactic will be about 90 per cent of the total acidity. That's

Q. Have you had some experience with bleached flour?

A. Oh, yes.

Q. Means of observing its characteristics and qualities, so

as to determine the effect of bleaching upon the flour?

A. I have worked, I think about an average of probably four or five years,—three or four years, I worked an average of a carload and a half a week, to nothing but bleached flour, for between three and four years.

O. Where was that?

how I generally find out.

A. At the Morton Baking Company, in Detroit, F. B. Whittleberger, in Detroit, and the present Witwear Baking Company.

Now, you may describe to us the effect of bleaching, upon the flour, as to its effect upon bread-making qualities of

the flour, as you have observed?

A. Well, the effect of it on flour—the only effect I—Now. I can scarcely answer that question, Mr. Butler.

Mr. Smith: You started out, all right, I think.

The Witness: No, I did not.

Mr. Smith: You started to answer it very well.

The Witness: Well, let me explain to Mr. Butler.

Mr. Smith: Well, you just answer the question,

The Witness: The thing is this, Mr. Butler.

By Mr. Butler:

Q. Go on.

That I used unbleached flour for a considerable time. and, all of a sudden, bleached flour was sprung on me, and I

didn't know what it was. I didn't know that it was

948 bleached. I didn't know anything about the bleaching
process. My first—I'll tell you. Perhaps Mr. Smith
will be interested in my first experience along that line.

Q. I am quite sure he will.

A. And it was this. I was with the F. B. Whittleberger Company, in Detroit, in 1906, when they had a carload of flour come in named "Sleepy Eye".

Mr. Scarritt: "Sleepy Eye", patent?

By Mr. Butler:

Q. . Made by the "Sleepy Eye" mill, in Minnesota?

A. At that time I had no right to say it was patent, low-grade, straight, or anything else.

Mr. Scarritt: I mean the brand.

The Witness: "Sleepy Eye" was the brand, made by the "Sleepy Eye" mill company, up in Minnesota.

Mr. Scarritt: Well, what I wanted to know, was it branded patent?

The Witness: "Sleepy Eye" was the brand.

Mr. Scarritt: Was it branded "Sleepy Eye", "patent"?

The Witness: I don't remember that. That was four years ago, and I wasn't very interested, as to whether it contained the word or not. Well, this flour stayed in the house about three weeks, which we always had done up to that time for the purpose of aging. About three weeks after it was in, I commenced to use it, and I went upstairs one day to put some in. I had the boy put some flour all ready for me to dump it into the sieve, and I up with one—I should mention I was using other flours, you know, I ought to mention that I was using other flours.

By Mr. Butler:

color.

A. I commenced to use this flour—this "Sleepy Eye" flour, but I didn't use that alone. So, I was making a four-sack dough—four 140 pound sack dough. I dumped two sacks in.

I took hold of the third, which was "Sleepy Eye", and

dumped that in. And when it was gone, too late to recall it, I smelled a very bad odor, and it was too late. It had gone in, so I put my hand to the next. I saw the next sack was "Sleepy Eye", and I put my hand to it, and took some out, and put that up to my nose, and that smelled the same way. I examined the stuff, and it had a very yellow

Mr. Scarritt: Yellow color?

The Witness: Yes, sir; that was different to any of the other of that car lot. Well, I goes straight in the office, and found Mr. Whittleberger. So, I said, "What kind of flour did you buy, here?"

Mr. Scarritt: Wait. We object to what he said to Whittleberger, or anybody else.

Mr. Butler: Well, now, you got into kind of a running conversation with the witness, yourself.

Mr. Scarritt: That was 5 minutes ago.

Mr. Butler: I know, but he can't pass on your objections, Judge Scarritt.

Mr. Scarritt: I am not making them to him.

Mr. Butler: I thought you were. I think the phraseology so shows.

The Witness: Well, I will leave out what was said.

Mr. Scarritt: Very much obliged to you.

The Witness: I gave such information to the head of the concern, that he went and fetched the representative of the mill. They examined the flour. He found there was objection, and they got the rest of the carload down, and they examined all of it, and they couldn't find any more like it. Mr. Whittleberger charges me today of having doped that sack of flour.

Mr. Smith: I object to what Mr. Whittleberger charges him with.

The Court: Objection sustained.

Mr. Butler: This whole thing was brought out by Mr. 950 Smith.

Mr. Smith: I haven't said a word to the witness about that.

Mr. Butler: They began to object to it. If they had just left it to me, I would have kept it within the rules.

Mr. Smith: It is incompetent, any way.

The Court: Objection sustained.

The Witness: At that time, I didn't know what bleached flour was, or anything about it, but I afterwards recognized the same smell in different samples of flour.

By Mr. Butler:

Q. Now, you say that you worked a carload and a half of bleached flour a week, for a long period of time?

A. On the average.

Q. Now, what I wanted to get at, from you, is, how that flour worked and made bread, as compared with like flours that were not bleached?

A. Mr. Butler, as a baker, we had no way of comparison, for the reason—

Mr. Smith: Now, we don't care for the reasons. Object to that as immaterial.

The Witness: Well, I ought not to have mentioned the word "reasons". I ought to have stated the fact.

Mr. Smith: You stated the fact. You said you had no way of comparison. I object to the witness giving reasons. That is immaterial.

The Court: I see no objection to him giving the reasons. You say you can't compare it? Let's get the facts Mr. Witness.

The Witness: The flour showed a different analysis, from the time we got to know about it being bleached.

By Mr. Butler:

Q. In what respect?

A. Showed that it was a longer patent,

951 The ratio of gliadin to glutenin was not the same. The ash, which is the greatest indicator to us of the length of a patent, was higher. Therefore, we had an inferior quality of flour. Only thing that looked good to us was the color.

Q. Then comparing color against color, the bleached flour was of lower grade than other flour of corresponding color, as

respects these qualities you have mentioned.

A. After it was bleached. After the flour is bleached-

The Court: (Interrupting) Answer that question, now.

The Witness: I couldn't tell one flour from another by color.

By Mr. Butler:

Q. Why?

A. Because I had got fooled so many times, by thinking that a flour was a better color than another. Color got to be of no value to me, in looking at a flour.

Q. Does your experience enable you to tell of the characteristics of the dough,—its elasticity,—of the bleached flour, as

compared with like flours which were not bleached?

A. Well, as I said, I had no way of comparing the bleached with the unbleached, because all the flours that I was working were unbleached. Afterwards, after the bleaching came into—

Q. (Interrupting) That is, you used unbleached, for a time,

and then all that you used for a time was bleached?

A. Was bleached; yes, sir.

Q. And, while you were using the bleached flour, you didn't have the opportunity to bring that into immediate comparison with unbleached flour? A. No, sir.

Q. So, you couldn't parallel the treatment of two flours known to be of the same kind, one bleached and one unbleach-

ed? A. No, sir.

Q. Now, do you know what effect upon the color and quality of flour natural aging has, in case that it is unbleached?
 952 ed? A. Oh, yes. Natural aging—the color, and what?
 Q. Color, and quality—bread making quality.

- A. During the first few days—the first few days after milling, or after it goes into our flour warehouse, it improves in quality—in bread making qualities, and in color, rapidly. It continues to improve, up to about—we will say between 60 and 90 days, and it is good flour,[ever]up to a year old; but there is a great improvement all the way. It can be traced all the way, from the time it enters the warehouse, up till 60 to 90 days.
- Q. Do you know whether or not flour which has been bleached improves in color, and in quality, in like manner, and to like extent as does the unbleached flour?

A. Well, after we got the bleached flour in, we found that the quicker it was used, the better.

Q. Well, does it improve, and change, with time, as unbleached flour does?

A. No. It was the reverse. It was better to use, say within a month. It will make far better bread than what it will after it has been in the warehouse two or three months. Its baking qualities are impaired by keeping it.

Q. And have you been able to form an opinion, as to the effect upon the color of the gluten, when it is washed out of

bleached flour, and unbleached flour?

A. Oh, yes, from samples. The one from an unbleached flour is very tough, and elastic. That is, from an unbleached patent flour, is tough, and elastic, and springy. For instance, put your finger on it, push it down, it will spring back, and the one from bleached flour is practically dead, inert matter, no elasticity,—practically none. If you put your finger on it, it stops there. For instance, if you squeeze it, it will remain very near the same as the impression you make with your fingers, and it will be short. In other words, it looks as though it is slightly rotted.

Q. In all of your experience with bleached flour, have you ever known any of it to improve, as to elasticity of the 953 dough, by natural aging processes, as does the unbleached flour?

A. No, sir. As I said before, the longer you keep it, the worse it seems to get.

Mr. Butler: I think that is all.

The Court: Now, gentlemen of the jury, for reasons that I need not elaborate, I agreed to adjourn promptly at 12, but it lacks a few minutes of it. We could not get very far with this cross-examination. Now, this case has already occupied very nearly two weeks. No doubt it is a considerable burden to some of you. It certainly is to me. I never dreamed that I was getting into this kind of a case when I came down here; but there is only one thing for us to do, that is, to keep good-natured about it, and not get nervous over it, and stay by it until we conclude it. The prosecution, Mr. Butler tells me, will conclude their case in somewhere from one to three days. Then we have the defense, and then I will have to map out for you, as best I can, in a charge, what I regard as the issues on trial here. Necessarily a good many things get in that perhaps were calculated to draw the mind of a laymen off to one side or the other. Now, you keep your minds open, gentlemen, and do not begin to talk about where the merits in this case rest, or who is in the right, or who in the wrong, and, notwithstanding it is a burden, I will have to ask you to have patience, and stay by this case until the conclusion. Just as well it is you and I, as twelve other jurors, and some other judge, going through this. Having entered upon it, we must finish it, and we ought to finish it right when we do finish it. So, you will be excused until Monday morning.

Whereupon Court stood adjourned to 10 o'clock a. m., Monday, June 13, 1910.

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Morning Session.

Kansas City, Missouri, Monday, June 13, 1910.

Court met pursuant to adjournment and the further hearing of this cause was resumed as follows, to-wit:-

George Freeman, in continuation of his direct examination further testified as follows:

By Mr. Butler:

Q. In the course of your examination so far, Mr. Freeman, you referred to the gliadin and glutenin. What do you mean by gliadin; what do you include in that?

A. The total protein of the wheat, soluble in diluted al-

cohol.

Q. Now, in your experience of making bread and other bakers' products out of bleached flour have you ever been able to determine or to observe or determine the effect of bleaching upon the flavor of bread?

A. An absolute lack of flavor in bread made from bleached

flour.

Q. Bread made from bleached flour is different from the bread made from the unbleached?

A. Decided difference.

Q. As respects flavor, I mean. A. Yes, sir.

#### Cross-Examination

By Mr. Smith:

Q. What experience do you say you had had, Mr. Freeman, in the use of bleached flour?

A. About between, about three and a half years.

Q. Three and a half years, using how much flour per week?

A. Average of a car and a half, say about three hundred and

fifty barrels per week.

Q. 350 barrels per week for three years and a half. Well, during this time were you using, were you mixing the bleached and the unbleached? A. No.

Q. Using bleached exclusively?

[—] Bleached exclusively.

- Q. And the bread made from bleached flour has a total lack of flavor? A. Yes, sir.
- Q. [The], for three and a half years you made bread which had a total lack of flavor? A. Yes, sir.

Q. Couldn't you get any unbleached flour in that time?

Q. Well, you see I was not buying the flour.

Q. Well, all right, you were not the boss of the mill, boss of the bakery, then?

A. No, sir. The boss of the bakery.

- Q. Who was? A. Why, Mr. Morton. Q. Mr. Morton? Who was Mr. Morton?
- A. Mr. Morton owns a big bakery in Detroit.

Q. Is he a practical baker?

A. He has been in the business thirty-two years.

Q. Well, Mr. Morton would know whether or not he was getting a bread which had a total lack of flavor, wouldn't he?

A. Of what we designate the wheat flavor.

Q. Well, you said that bread made from bleached flour had a total lack of flavor, didn't you, isn't that what you told this jury? A. Absence of flavor, yes.

Q. All right, a total absence of flavor.

- A. Perhaps I had better qualify it, bread flavor.
- Q. I would not qualify it. A. I would.

Q. You told the jury, did you not, that bread made from bleached flour had a total lack of flavor?

A. Yes, sir.

- Q. Now, Mr. Morton can tell that as well as you, couldn't he? A. Certainly.
- Q. For three years and half in that bakery you used bleached flour exclusively? A. In that bakery?

Q. Yes, sir.

A. I didn't say that, you cut me off there, you didn't let me answer thoroughly.

Q. I did not cut you off at all.

- A. Excuse me, but I started to tell where I was at during the three and a half years, you cut me off as soon as 956 I said Morton.
- Q. Where did you use bleached flour for three years and a half? A. Morton's.

Q. How long in Morton's?

By Mr. Butler:

Q. Did you finish your answer, Mr. Freeman?

A. No, sir, that is where he cut me off.

By Mr. Smith:

Q. We'll come to it now, answer my question, please. Where did you use bleached flour for three and a half years?

A. Well, will you let me finish up if I start?

Q. Please answer my question. Where did you use bleached flour for three and a half years?

A. Well, say about six months at Morton's.

Q. Six months at Morton's?

A. One year at Wittelberg's, and two years with the Witwer Baking Company of Kalamazoo.

Q. What is the name of that? A. Witwer.

Q. And the baking company you are now with you used it two years? A. No, sir.

Q. Now, when did you commence using it?

A. The day I commenced there.

Q. When was that?

A. 20th of July, 1907, I believe it was

Q. And you continue using it at this time, the company with which you are now connected, up until what time?

A. About June last year.

Q. June, 1909?

Q. June, 1909? Now, who is the manager of that bakery during that period of time?

A. Of the present Witwer Baking Company?

Q. Yes.

A. Well, I was one of the management.

Q. Who had charge of the baking?

A. The baking end of it.

Q. Now, during that time were you mixing your flours during these two years, that is mixing bleached and unbleached?

A. No, sir.

Q. Were you using part of it bleached and partially unbleached? A. No, sir.

Q. Using bleached exclusively? A. All bleached flour, yes, sir.

Q. Now, who bought these flours?

A. The secretary and treasurer of the company.

957 Q. Did you have anything to do with the purchasing of them? A. Yes, sir.

Q. What part did you have?

A. I had to do in passing of them.

Q. You passed the flours, did you? A. Yes, sir.

Q. Well, now, for two years haven't you passed these flours, and during that time you used just part of the time or all the time bleached flour? A. All the time.

Q. Nothing else? A. Not to my knowledge.

Q. The two years, for two years for the present company?

A. Yes, sir.

- Q. And yet you say that that flour makes a bread which had a total absence of flavor? A. Yes, sir.
- Q. Now, couldn't you have gotten unbleached flour during that time? A. Practically, no.

Q. Why not?

A. Because we could not make bread to compete with our competitors if we pay the exorbitant price of the bleached flour, because it created a very small market to buy from.

Q. I don't know as I understand you.
 A. The price of flour was very high.

- Q. You mean exorbitant price of the bleached or the unbleached?
- A. Excuse me, you have it wrong there, it is the exorbitant price of the unbleached flour.
- Q. That is what I supposed you meant unbleached; your competitors were using bleached, were they, or unbleached?

A. Bleached, as far as I know.

Q. All the bakeries there in Kalamazoo were using bleached? A. As far as I know, without any exception.

Q. They preferred it to the unbleached? A. No, sir.

Q. But they all did use it?

- A. Now, I can only speak in answer to that question how I have talked to them.
- Q. So far as you know, they were all using bleached 958 flour? A. Yes, sir.
  - Q. And for that reason you used bleached flour?

A. Not for that reason.

Q. For what reason did you use it?

A. Because the price of the unbleached was so exorbitant, as I said, it narrowed the market, there was 80 per cent of the flour, about 80 per cent of the flour on the market practically bleached at that time, there had only been 20 per cent unbleached.

Q. And because of the difference in the price you used the blenched flour? A. Had to.

Q. Now, did you find that all this bread that you made during that time had a total absence of flavor?

A. Distinct lack of flavor.

Q. And yet you made it? A. Yes, sir.

Q. And your customers bought it? A. Yes, sir.

Q. Were there any bakeries around in Kalamazoo that were using unbleached? A. Not to my knowledge.

Q. They all went on the market and bought the bleached

flour, did they? A. Well, as far as I know.

Q. As far as you know all of them using it now, or have they all quit it now?

A. I don't believe any of them are using it now because the market is bigger for the unbleached flour.

Q. The market is bigger for the unbleached flour?

A. Yes, sir.

Q. Would not that send the price of it up instead of down?

A. No, it brought the price to its proper level.

Mr. Butler: He means there is more flour in the market.

Q. Now, who were you with the one year that you used the bleached flour? A. Witwer.

Q. Where is that?

A. Detroit, Michigan; they buy bleached.

Q. Did you use bleached flour or part bleached and part unbleached? A. No, sir.

Q. Were you using bleached flour exclusively or use bleached flour today and unbleached tomorrow?

A. Perhaps I better explain it to you a little. About there, bleached flour and unbleached flour came on the market while I was there, and I couldn't tell the difference.

Q. What?

A. I couldn't tell the difference for a while.

Q. How long did it take you before you could tell the difference?

A. Why, I guess I was told it was bleached practically before I knew, because I had not tested any.

Q. Why couldn't you tell by the flavor of the bread that it was bleached flour?

A. I know there was a distinct lack of flavor in the bread, but I didn't know what was the cause.

Q. You knew what it was, how long did you use it with

these people?

A. Why I commenced using it there, that was the first knowledge I had of it.

Q. I say how long did you say you was with them?

- A. Why, I was with them a year, and I was there very near three months, practically, before I knew that I was using any bleached flour.
  - Q. You knew it for the last nine months, did you?

A. Oh, yes, sir.

Q. Continued to use it? A. Yes, sir.

Q. Well, now, did you use it all the time during that nine months or did you mix some of the unbleached?

A. Well, it was all bought the same.

Q. Bought as bleached flour, you used it?

A. I don't know as it was qualified as bleached flour, but bleaching came into vogue at that time.

Q. Well, it all was bleached that you used during that nine

months? A. To my knowledge.

Q. And made a bread that was wholly without flavor?

A. Distinct lack of flavor.

Q. But you continued to use it during all the time you remained with them? A. Oh, yes.

Q. And then you were for six months with whom?

A. Mr. Morton.

960 Q. Oh, yes, and when was that? A. Was what? Q. That six months that you used it with him?

A. Why, in what way do you mean?

Q. I want to know when it was that Morton used this, this year or last year, or what year was it?

A. Oh, I guess it was about 1907.

Q. Were you with him just six months? A. Just about six months, as near as—

Q. And you used bleached flour all the time?

A. Yes, sir, some of it was this "Integrity" that you were speaking about last week.

Q. Came from where?

A. From down in Kansas somewhere.

Q. Oh, that was some that Mr. Barnett spoke about?

A. Some of that flour was under question last Friday.

Q. Some of Mr. Barnett's flour?

A. I don't know whose flour it was; I only know the brand "Integrity".

Q. Well, do you know that that was bleached? A. Sir? Q. Do you know it was bleached, the flour that is branded "Integrity", do you know it was bleached?

A. Why, I was not qualified enough on bleached flour at that time to say whether it was or not.

Q. I see. Now, altogether, you have been baking in the state of Michigan how many years? A. About five years.

- Q. And about five years, and for about three years and a half or four and a half years of that time you have used bleached flour? A. Yes, sir.
- Q. Now, you speak of the different components of flour. You could not make bread with pure gluten, could you?

A. Pure gluten?

Q. Yes.

- A. Why, that would be distinctly flavorless, odorless, tasteless; it would not be bread.
- Q. No, it would not be bread, and you could not make bread if you had just the pure starch of the wheat, could you?

A. No, sir.

Q. Now, what is whole wheat bread?

- A. Whole wheat bread is the bread which is supposed to be made from the flour milled from the whole of the wheat.
- 961 Q. There are very many people who regard whole wheat bread as the best bread they can get, don't they?
- A. It is regarded mostly by unhealthy people, by experience.
  - Q. A person whose health is not the best? A. Yes, sir.

Q. You heard the testimony of the doctor from Milwaukee, did you not-Dr. Kempster? A. No. I did not hear it.

Q. You did not hear his testimony. Well, you know it is true, do you not, that there are many people who prefer the whole wheat flour to either patent or any other kind of flour?

A. Well, there seems to be quite a number because out of our fifteen thousand loaves as we bake on a day, there will perhaps be twenty or thirty who demand whole wheat flour.

Q. You manufacture whole wheat flour at your mill?

A. Yes, sir.

# By Mr. Butler:

Q. Twenty or thirty?

A. Out of fifteen thousand, so there must be somebody demands it.

Q. There is some demand for it? A. Yes, sir.

Q. A patent that was only a 20 per cent, or down so fine as that, could you make good bread out of that?

A. Why, no, that would not make good bread, but I believe it would make good pies and pastry and cake.

Q. But it would not make good bread?

A. No, the ratio of gliadin and gluten would not have disappeared enough to make a big enough loaf; it would not give the expansion or volume to the bread.

Q. In the unbleached flour you put a little more water than you did in the bleached? A. Yes, sir.

Q. In order to get the same volume of bread?

A. Yes, sir.

- Q. Now, could you tell the difference in the color of the loaf as it came out of the oven, the bleached and the unbleached? A. Yes, sir, we could tell that.
  - Q. That is, a marked difference, is there?

A. Why, the one-

Q. Answer my question, it was a marked difference, is there? A. A marked difference.

962 Q. Has it an objectionable color?

A. With the bleached, oh, yes, distinctly, objectionable.

Q. Everybody objects to it.

A. Now, I can't say everybody; I could not voice everybody.

Q. Well, did your customers generally object to it?

A. Well, I generally tried to remedy things before the cus-

tomers ever had a chance to object.

Q. That was not my question at all. I didn't ask anything about what you was trying to remedy. I try to make my question plain, maybe I don't. My question is did your customers object to the color of the bleached flour loaf?

A. Oh, no.

- Q. It satisfied them, did it? A. I don't know.
- Q. You never heard a complaint, did you? A. Oh, yes.

Q. Then it did not satisfy them, did it?

- A. It did not satisfy all of them, that is sure, otherwise would not have heard of it.
- Q. The three years you were there you used bleached flour exclusively? A. Yes, sir.

Q. Have you been in any of the bakeries here in Kansas

City? A. I beg pardon.

- Q. Have you been to any of the bakeries here in Kansas City? A. Yes.
  - Q. Been in the largest bakery here? A. Yes, sir.
    Q. You know it uses nothing but bleached flour?
- A. I know nothing, I did not ask a question because I was down here as a witness.
- Q. Were you at the Smith Baking Company, the largest in Kansas City? A. Yes, sir.
- Q. As a matter of fact, it don't use anything but bleached flour and won't use anything but bleached flour?
- A. Absolutely, Mr. Smith, I don't know the first thing about it because I never asked them.
  - Q. Did you examine their bread?
  - A. No, I saw it on the rack.
  - Q. Was it odorless? A. Odorless.

963 Q. Yes, sir, was there a total lack or odor to that?
A. I never went near it; I saw it standing on the racks.

Q. Was it offensive in its odor?
A. Didn't smell or go near it.

Q. Was it objectionable in its appearance?

A. Did not attempt to criticize it.

Q. Did you see anything wrong with the odor made at the

Smith Baking Company of Kansas City?

A. I could not pass any opinion on their bread because I did not criticize or go near their bread; I just talked with the foreman as he used to bake under a friend of mine.

Q. Well, didn't you learn there that they used nothing but

bleached flour?

A. Didn't learn anything because I didn't ask for it.

Q. Didn't he tell you so? A. No, sir.

- Q. Well, from your knowledge that you have acquired, either from that source or any other source, don't you know that the Smith Baking Company of Kansas City uses nothing but bleached flour?
  - A. No, sir, I have not the least knowledge of it.

## Redirect Examination

By Mr. Butler:

Q. You say that the bakers at Kalamazoo did not prefer to use bleached flour over unbleached flour?

A. They preferred to use unbleached flour.

Q. Well, why did they use the bleached, then?

A. Because 80 per cent of the flour, over 80 per cent, or about 80 per cent of the flour of the total flour of the country was bleached flour, bleaching was in vogue; we would object to that, but we would get it just the same.

Q. Yes, sir. You say at first you did not discover that it was bleached, and couldn't find the cause of the difference in

flavor, the lack of flavor, of the bleached flour?

A. Yes, sir.

Q. Now, what experience did you have with this bread 964 or flour called "Integrity", that Mr. Smith refers to in his cross-examination?

A. I went to the Morton Baking Company, commenced there as foreman or head baker, just which you call it, and they had some flour there which they had difficulty with and stopped using it because they could not make good bread from it. They asked me if I could work it up, as they bought eleven carloads; I presume it was pretty close to some thousands of barrels of it, they told me it was eleven carloads, they bought it, it was in storage, they could not use it, but they had used about half, a car of it and could not use any more, and asked me if I could handle it.

Judge Scarritt: I object to that as mere conclusions and statement of hearsay of the witness.

Q. Go on, tell how it worked when you tried it.

Judge Scarritt: It is not in answer to that question at all.

A. I found I could work it by cutting down the water and taking the dough in shorter time.

Q. What do you mean, shorten the period of raising?

- A. Shorten the period of fermentation, cut down the water, making it stiffer so as to get a higher condition or a higher ratio of water or flour in the water than what they previously had, and in that way I worked it off by blending it with flour that they had in storage at that time, I blended it two sacks of that to three of the other flour.
- Q. Now, you say the unbleached flour will take more water than the bleached flour?

A. It will carry more water.

Q. Now, explain what you mean first by taking more water, and then explain what you mean by carrying more water; I don't know that I understand that fully here yet.

A. By taking more water I mean that we make a dough, we make it for a certain stiffness, and I had to use less water with the unbleached and make the dough stiffer because then comes in the water carrying it; we make a dough a certain

consistency or a certain stiffness, and it has five or six hours for fermentation, and during that five or six

hours' fermentation will depend the stability of the flour. If it is a flour that has good stability like I described the unbleached flour it will be about the same stiffness at the end of five or six hours as what it was when it was first made; but the flour that has not the stability, was slacked off during that five or six hours, and be a little slacker when it comes in the table to be made up into pans, than [when] it was when it was first made; that is what we call carrying water into it and will make water.

Q. Well, has the quality of the gluten any effect upon that,

upon the taking of the water or carrying of it?

A. Oh, yes, the quality of the gluten, all depends on the quality and condition of the gluten; that is where aging comes in.

Q. Now, with a good gluten and good condition, you say it takes more water and carries more water, how is that?

A. Why, with a good gluten in good condition it carries much more water.

Q. And you say the bleached flour would not carry as much water as the unbleached?

A. Would not carry it; it would be the same consistency when it came out of the mixer, but it would not, what we term, carry it, at the end of fermentation, when it comes to the oven.

Q. Now, as to the strength of gluten, as holding the gas, take the raising process, there is gas formed? A. Yes, sir.

Q. Now, have you been able to observe whether or not the gluten of the bleached flour would hold the gas as well, the gas bubbles, as well as the gluten of the unbleached?

A. Oh, no, that is why I said we had to make the dough

stiffer or cut down the water to get the volume.

966 George A. Hulett, called as a witness on the part of libelant, being duly sworn, testified as follows:

## Direct Examination

By Mr. Butler:

Q. What is your name? A. George Hulett.

Q. State your profession and occupation, Professor Hulett.

A. I am at present professor of physical chemistry at Princeton University, physical and electro chemistry.

Q. What is physical chemistry as distinguished from analytical chemistry and physiological chemistry, and so forth?

- A. Well, physical chemistry deals particularly with the atoms, about physics, and chemistry—the province of it is, principally the fundamental principles of chemistry, that includes electro chemistry, that is to say the relation between electric energy and chemical changes, and things of that nature.
- Q. And what has been your education, degrees, and so forth?
- A. Well, I was graduated at Princeton University in 1892; was assistant in chemistry there for four years after being graduated; then I studied in Germany for three years in Oswald's laboratory in Leipsic, where I took a doctor's degree. On returning to this country I went to the University of Michigan as an instructor in physical and electro chemistry, and I was there for five years as instructor and assistant professor, and in 1905 I was called to Princeton University as professor of physical chemistry, and I have been there since.

Q. Have you made any examination of any of the flour

which has been seized in this case?

- A. Yes, sir; I have examined the flour that was seized in this case. I got a sample from an exhibit here, one of the exhibits, Mr. Winton's bag of flour.
  - Q. The bag that was sent to Mr. Winton's laboratory?

A. Yes.

Q. This flour here in evidence in the court?

A. This flour in evidence. Mr. Winton witnessed my taking the sample.

Q. Do you remember which particular bag it was here,

967 or did he point out the bag?

A. He pointed it out and opened the bag, and I took

the sample and he closed the bag.

- Q. Now, what examination did you make of that flour; did you examine it to ascertain whether or not it contained any nitrogen peroxide gas, nitrite re-acting material, or anything of that sort?
- A. I examined that flour from the standpoint of determining whether it contained nitrogen peroxide and nitrous acid.

Q. Where did you make the examination?

- A. I made the examination here in your food laboratory.
- Q. That is, in this building? A. Upstairs, yes, sir. Q. That is since the commencement of this trial?

A. Yes, since June 4.

- Q. I would like to have you describe to the court and jury how you examined it and what you found?
- A. Well, in some previous work, in some previous work at Trenton before I came here—

Mr. Smith: That ain't the question.

Q. Well, I withdraw it. Preliminary to that you may state whether or not you did any previous work on bleached flour.

Judge Scarritt: On this flour.

By Mr. Butler:

Q. On bleached flour, on flour bleached by nitrogen peroxide gas.

Judge Scarritt: We object to that because he stated that he has had experiments on this identical flour. It is immaterial what he has done on other flour.

The Court: He may answer.

To which ruling of the court claimant then and there duly excepted.

Q. Analytically, I want it. Go on.

A. I may answer what I did previously as to experiments?

Q. Yes.

A. Simply as an explanation I would say that previous experience showed me that I found nitrogen peroxide in the air, in flour, and nitrous acid in bleached flour, and that I

968 could pump it out and get it out, and since I have been here and taking this sample of this particular bleached

flour and I have been able to pump out nitrogen peroxide and nitrous acid out of the flour. The way I do that is to put the

flour in a vacuum, and then from a tube—perhaps, the apparatus would make it very clear as to what I did with this flour. I have here the apparatus that I used, not for the flour, but one similar, for the flour; this is the one I used for bread made from the flour. Now I think you can all see here.

Q. Professor Hulett, perhaps everyone could see much more easily if that was sitting there, and it would be easier for you.

Can all the gentlemen now see the thing?

A. I don't think they can very well.

Q. Then perhaps His Honor would permit you to set it there. A. If I should stand—

Judge Scarritt: If you take a seat.

By Mr. Butler:

Q. Now, can you describe it. Let me give you a little

pointer, perhaps, so you can reach it.

A. You will see that this is a glass flask here in which I introduce my flour and that I am working with; and furthermore, this apparatus was constructed, in this apparatus we have here a tube, leading off here with a waste cock: then here is a tube leading down, so that is closed, simply closed; now this tube up here is closed also; this is simply for the purpose of removing this liquid with a long capillary tube and bulb. I put the flour in a flask of this kind, about five hundred grams of it, about a little over a pound, and then I closed it up, and then I pumped the air all out, used a mercury pump, that would pump that air all out; when it was all pumped out I turned this cock, so that there was nothing in there, that removed the air and everything, then I brought a cooling mixture on the lower part of this tube. Now, I used, I used this, what is known as a R. R., but you probably know it as a Thermos bottle; I put my freezing mixture then, bringing it around the outside of that tube. Now, under those conditions if

your temperature is low enough there, that will condense the moisture, water, fluid, that is continually coming from my flour, the oxide of nitrogen, and also the products of nitrous acid as it volatilizes; in other words, it is a method of distillation; I have the temperature outside higher than it is here, or have this temperature very much lower than room temperature, so my flour remains at room temperature, I do not treat it chemically or otherwise, and in time it leaks rather slowly, it depends upon the vacuum, if you have a good vacuum it goes fairly rapidly. There is some liquid, for instance, that I collected from this particular sample of matter and in the same way. I collected a liquid which is largely water, from the flour in question. Now, we have samples of that here. Here I have a sample of liquid—

Q. Just a moment. We will have to mark these things as we go along, I think, in order to avoid confusion, mark them all, that is label exactly what it is. Label, June 6, 1910, liquid condensed from flour I S 12351, B Griess applied June 13, 1910, G. A. Hulett.

(The bottle referred to was marked by the stenographer Exhibit 20.)

Q. That is marked "Government's Exhibit 20". Now, is

this the one corresponding to it, Doctor?

A. This liquid is liquid, a part of the liquid, not all of it, a part of the liquid that I condensed from this particular sample of flour, that I put in the flask.

Q. That was taken out of this seizure here by Dr. Winton

in your presence in the courtroom?

A. It was; that was done on June 6th and following days, and this morning that was perfectly clear liquid; this morning I put in the Griess re-agent to it and you see a color in connection with it which shows that there is nitrous acid in the liquid that I condensed from the flour. You can probably see it as well there as not.

Q. Now, that we may be sure that we understand the steps taken to examine this particular flour, as I follow your description you place the flour in a flask corresponding to the flask in this instrument that is here in court in which the bread is contained, and first by means of an air pump exhausted the air.

Judge Scarritt: He has explained it.

Mr. Butler: I want to be sure. There is no objection to repeating a little of it. It is not easy for me to understand one of these things at the first discussion and I presume perhaps, it may not be to the others. I myself, have seen this thing done, so I'm not doing it for my own benefit; it is for the court and jury.

Q. And after that is done you continue to pump and about this vertical tube you keep a cooling mixture?

A. That is correct, yes, sir.

- Q. And the effect of that is to condense the vapors pumped from the bread? A. That is correct.
  - Q. Or flour, as it was in this case? A. That is correct.Q. And that condenses into a clear liquid? A. Yes, sir.
- Q. Now, from this very flour that was furnished you in the courtroom here by Professor Winton you pumped out this liquid and some other liquid which is contained in Government's Exhibit 20, and when pumped out that was clear as is this liquid in the instrument here, arranged for testing the bread? A. Yes,

Q. And this morning before taking the stand you introduced into the liquid the Griess-Ilosvay test?

A. That is correct.

- Q. And it turned it to the color that it now shows; is that correct? A. That is correct, yes, sir.
- Q. Now, is this Griess-Ilosvay test also clear in color, the color of the test itself, is that also clear?

A. Yes, sir, it is.

Q. Transparent like water or something like water?

A. That is I believe like water very much; I took the best

reagent.

- Q. Had you before introducing this Griess-Ilosvay test in the flour which is in Government's Exhibit 20, tested some of the same flour? A. I had.
- Q. And did you test it so as to measure the amount of nitrous acid or NO2 that you found in the flour seized and which was furnished you by Winton here in the courtroom? A. I did.

Q. And how much did you find?

A. I found 2 and ½ parts of NO2 as nitrous acid per million of that liquid.

Q. How do you get at-how do you measure the quantity?

A. Why, I took a given volume.

Q. Well, is it measured by color or weight, put on the scales to be weighed?

A. Measured by color, comparative with a solution containing a given amount of nitrous acid.

Q. Now, what effect upon color has varying volumes of nitrous acid in such a solution?

A. It increases the color; the greater the amount of the acid, the nitrous acid, the more intense the color.

Q. And then by taking known solutions, a number of them, you compare the specimen under examination with known standards and arrive at the amount that way?

A. That is the usual method of determining nitrous acid,

that is what is done.

- Q. Have you made any examination to ascertain whether or not there is nitrous acid or NO2 in bread made from the flour that was seized in this case? A. I have.
  - Q. Who furnished you the bread, and when and where?

A. Miss Wesling furnished me the bread.

Q. She is one of the Government employees, is she not?

A. She is, I believe.

- Q. Hannah L. Wesling, her name is. Now, how did you examine the bread to ascertain whether or not it contained NO2?
- A. I put the bread in this particular flask we have before us here that is the sample of bread that I worked with; that

is three-fourths of the sample furnished me by Miss Wesling, made by the Koelner process, I believe.

## By the Court:

Q. Koelner?

A. Koelner process, and she had made that bread, so she stated to me, from the flour, the seized flour.

972 By Mr. Butler:

Q. Well, we expect to show that she did.

Mr. Smith: Well, I don't doubt that, but I don't think the witness ought to detail,—

Q. I think he has a right for the purpose of maintaining the chain of identification.

The Court: With the understanding that this lady is to be called as a witness to identify it he may testify.

Mr. Butler: Certainly.

Witness: And I put the bread in the flask there, I think it was done this same date, like that, and closed the flask up, and then pumped out all the air, and after I pumped out the air I put my cooling mixture in this Thermos bottle, and then I brought it up, I remember the shape there of this particular case, I used liquid there, and I condensed the liquid. Now, here is part of the liquid that I condensed, and another part of it, I have here a tube to which I added the Griess re-agent, here is the part that I took out this morning, made that tube and put it in that glass pipe and sealed it up and added the Griess re-agent to it before sealing it up.

Q. Now, the tube that you refer to is marked "June 8, 1910. Liquid condensed from bread from I 8 12357—is it 57

er 51?

A. It is 12351, I believe, 12351 B I S, and the Griess reagent applied June 13, 1910.

Q. This morning before coming to court? A. Yes, sir.

(The tube referred to was marked by the stenographer "Government's Exhibit 21".)

Q. Now, that Exhibit 20 contains the test for nitrous acid on the liquid taken directly from the flour, the test having been applied just before you took the stand?

A. Yes, sir; that is correct.

Q. And Exhibit 21 shows the test on the liquid taken from the bread, the test having been applied just before you took the stand this morning? A. That is correct.

Q. Now, by comparison of color can it be stated which of the two is the strongest in nitrous acid?

A. It is possible to do that.

Q. Can you tell from your present position, or have you de-

termined quantitatively?

A. I have determined quantitatively in the laboratory where we have a known—or we have solutions made up with a known amount of nitrous acid, and where we have a more exact method of comparing those two; it is a little difficult at this distance.

Q. Well, what is the quantity determined from the bread?

A. Determining in that way the amount of nitrous acid in the liquid condensed from the bread I find 1.2 parts of NO2 as nitrous acid in that liquid.

Q. That is two and a half parts of NO2?

A. No, 1.2 per million.

Q. Yes, sir, but the flour was two and a half parts?

A. Two and a half.

Q. And the bread was 1.2?

A. The liquid from the bread was 1.2 from the bread per million.

Q. Now, in testing this flour and bread did you add any substance or thing whatsoever to the flour or bread?

A. Nothing whatsoever.

Q. Now, with respect to the temperature of the flour and bread at the time of the pumping operation?

A. The flour and bread remained at room temperature during all the operation; I did not change.

By the Court:

Q. By room temperature you mean the room where you

were working?

A. The room where I was working, and that room temperature was, I should say, in the neighborhood of 20 to 25 degrees centigrade.

By the Court:

Q. What is that Fahrenheit?

Mr. Butler: 100 is the same as 212.

The Court: Yes.

974 By Mr. Butler:

Q. 100 and 212 Fahrenheit.

A. 25 degrees centigrade is 75 degrees Fahrenheit. very nearly.

The Court: Practically the same as the room we are now in.

A. The laboratory is perhaps a little bit warmer than this room, although we have a good draft there, perhaps not.

By Mr. Butler:

Q. By the way, I would like to ask you whether or not the color appearing in Government's Exhibit 20 and Government's

Exhibit 21 as a result of the application of the test is stable, or

whether by lapse of time it will change?

A. The color of that solution will decrease with the lapse of time, probably due to the fact that the azo dye that gives the color separates out, and it could be due also to the fact that there is some organic matter in that liquid, a small amount, because in condensing there are certain vapors from that that are condensable and they probably contain some organic matter.

Q. And what effect would the organic matter contained in liquid of that sort have upon the stability of the color test?

A. Well, I think it would probably cause it to decrease it

at times.

Q. I think in your testimony so far given you used the expression of the air contained in the flour? A. Yes, I have.

Q. Now, what do you mean by that?

A. Well, flour consists of a lot of fine particles, and they are not closely packed, and we find that there is air all through in our flour; as far as I can find the density, the specific gravity of wheat is about one, about the same as water—not an exact determination, but that is very close to it, and I also understand that flour is about .65 or .64.

By Judge Scarritt:

Q. What do you mean by that .65?

A. It is .64 times as heavy as an equal amount of water. Taking those figures I would conclude that the given volume of flour was about one-third air.

Q. That is the air between the particles of flour dust?

975 A. Yes, sir, that is to say if the particles of flour were so closely packed that there was no air between them, the volume would be one-third less.

Q. Now, in your examination of this flour that was seized did you ascertain whether or not there was any NO2 in the

air mixed with the flour?

A. The fact that I condensed water here and got in it nitrous acid is conclusive proof that there was NO2 in the case that was seized there to that liquid.

Q. Did you make any ascertainment to find out whether or not there would be NO2 or was NO2 in the air in the flask which was not mixed with the flour, that is, the part of the

flask that was not occupied by the flour?

A. Before condensing any liquid by the cold moisture around the tube below, I pumped out all of the air in the flask and I pumped it out with a mercury pump so that it was practically all out, that is not only the air in the flour, but the air, not only the air in the flask, but the air in the flour; you can remove it quite completely with a good mercury pump, and then after all of that air had been removed that

was not water, vapor and nitrogen peroxide, it contained, then I put the freezing mixture on this lower tube and began to condense liquid or vapor that was coming from the flour, so it had nothing to do whatever with the air that was around the flour or in the flask at the start of the experiment.

Q. Does there an equilibrium of gases exist between the

NO2 and flour and the air about it?

A. I have some experiments which show that there is an equilibrium between the flour and the air that is in intimate contact with it.

Q. Will you describe those methods by which you made

such experiments?

A. I have a diagram here, perhaps that will make it clear. The diagram referred to was marked by the stenographer "Government's Exhibit 22".

Mr. Butler: Now, there are various figures on this Exhibit 22, perhaps they ought to be marked some way, what would you suggest—A, B & C?

976 A. Yes, sir, we call that—those two go together, those four flasks, and that is A, and you might call this B.

Q. You may call this AA, then.

Now I think I took flasks of the same volume, I tested out a large number of flasks, and I got four of the same volume, and in this flask, for instance, I placed some flour which had been bleached, and after I placed the flour which had been bleached in this flask, this flask, tube, flask was removed, and by means of the pump I pumped all the air out, which took the air not only above the flour, but the air that was in the flour, removed it all, then taking it outdoors where there was pure, fresh air, I let in some pure fresh air and filled the flask with that; then the flask was taken into the room where the temperature was constant, and it was allowed to stand with occasional shaking, for twelve hours, the object being to allow the air that—the pure air that I had introduced to come into equilibrium, to take up whatever it would from the flour; the temperature was constant. After that this upper flask was placed on here, and it had been evacuated, that is all of the air pumped out with a mercury pump, and we can pump it out quite completely. Then this cock was turned, and of course the air in here expands up into this flask, and I took out half of the air that was in here, or, in other words, I measured it so that I knew the amount in there, I had a little bit of asbestos plug here to filter it so that no dust could get through and no air could get through. Then this flask was removed, a little caustic potash was put in there to absorb any gas we had in the flask, and then it was determined, the amount of nitrites that I obtained was determined and I found nitrites. Now, I took this same flask and pumped it out again, leaving the same flour in there, and took it outdoors and introduced fresh air, and then let it stand again and repeated the experiment in that way several times, and that is the amount that I got here at the various times, the various amounts were in fairly good agreement. That would show then that this flour gives up nitrogen per-

oxide to air which contain unmeasurable quantities of nitrogen peroxide; I tested the air and again de-

tected nitrogen peroxide in it.

Q. How many parts to the million of nitrites?

A. Take the two liter flasks of that air, I could not get the test for nitrites by means of caustic potash, absorbing whatever there was in caustic potash, the two leader flasks of that air would be about two and a half grams, and I calculate from the delicacy of the Griess test that I should have been able to determine about five parts, as I remember my figures, in a thousand million.

Q. Five parts to the billion?

A. Yes, sir; and so I concluded there was less than that. Now, the amounts that I got up that I obtained here were something over one part, or in the neighborhood of one part in the million, so that there is—

Q. The amount that you obtained here, now, what do you

mean by that?

977

A. That I obtained in this experiment.

Q. In the flask?

A. In the air thus taken from this flask.

Q. That is in the air that passed to the upper flask?

A. Yes, sir.

Q. In the manner you have described. Now, the degree of your vacuum, how much of a vacuum did you have, Mr. Elliott suggested the question?

A. Yes, that is important, to a certain extent. I used first a geryck pump, it is a well known pump for producing a vacuum and will give a vacuum of less than half a millimeter

of mercury.

Q. And then?

A. And then I used a mercury pump, a so-called Toppler pump, I believe, it is a well known instrument, and that would reduce it to less than one-tenth of a millimeter of mercury.

Q. Well, now, is that a pretty good vacuum?

A. That is a very high vacuum in air; that would be something like one part in eight thousand.

Q. Now, this work was done at Princeton?

A. This work was done at Princeton, yes,

978 Q. What particular flour did you have there on this work?

A. On this work I used flour which was bleached in the Princeton laboratory.

Q. You bleached it yourself?

A. I bleached it myself.

Q. Where did you procure the flour before bleaching it?

A. I procured the flour at the Kingston Mills, Kingston, New Jersey.

Q. That is a mill in that neighborhood?

A. Yes, it is about three miles from Princeton,

Q. Was it bleached when you got it?

A. No, we tested it, and it gave no test for nitrites, and the mill has never used the bleaching process for flour.

Q. How was it bleached and to what extent, what quan-

tities of NO2 were employed?

A. In this particular experiment that I indicated here as "A" the flour was bleached with 18.6 parts of nitrogen peroxide per million.

Q. And how much nitrite re-acting material would that add to the flour theoretically, assuming that it all could be re-

covered?

- A. That would add to the flour theoretically, assuming that the nitrogen peroxide-goes to nitric and nitrous acid in the water and the flour, it would add chemically one-half of that as nitrous acid.
  - Q. As nitrous acid? A. As nitrous acid.

Q. That would be 9.3 parts per million as nitrous acid?

A. Yes, sir.

Q. And as nitrogen what would it be, various expressions have been used to mean the same thing by different investigators?

A. Well, if you divide that figure by 3.3—3.28, I believe it is, the 3.3 is sufficiently accurate. You divide by 3.3 you will get—9.3 by 3.3 would be about three parts, computed about three parts of a million computed as nitrogen, a little less than three.

Judge Helm: 9.3 divided by 3 would be 3.1.

979 By Mr. Butler:

Q. It is divided by 33, 3.3 it will be about one-third of it, it will be about one-third of it, in other words when we speak of quantities of nitrous acid or NO2 in parts per million, and want to compare it with the same thing expressed as nitrogen, roughly, if we divide by 3 we will get pretty close to it, don't we? A. Very close to it, yes, sir.

Q. Did you make more than one such a test to ascertain

the relation- A. Yes.

Q. Of the strength of concentration of this gas, depending upon the amount of NO2 used for bleaching? A. I did.

Q. You may give it.

980

A. I made three experiments. The first one, the flour that I used in the first experiment was bleached with 18.6 parts of NO2 in the million, and the flour in the second experiment was bleached with 38.4 parts of NO2 per million parts of flour, and in the third experiment the flour was bleached with 74 parts of NO2 nitrogen peroxide to the million of flour.

Q. Now, can you give us the result of the parts of NO2

in the million part of air, in equilibrium with the flour?

A. Yes, I have put it in the form of a table here, and perhaps it will be clear if I give the table—simply put the table up here.

(Witness here produced certain tables which were marked by the stenographer "Government's Exhibits 23, 24, 25 and 26", respectively.)

Q. You may go on by the use of your table.

A. I have tabulated here the results obtained with bleached flour, with different amounts of nitrogen peroxide. I have in this column the amount, the number of parts of nitrogen peroxide used in bleaching a million parts of flour, 74 in this experiment 74 parts of nitrogen peroxide we used in bleaching a

million parts of flour, and then the air that had been in contact with that flour, that air was removed by the ap-

paratus I showed you, and it was analyzed and was found to contain five parts of nitrogen peroxide in the million parts of the air, expressing everything in parts per million. In this other experiment where I used the flour, it bleached with 38.4 parts of nitrogen peroxide per million of flour. I found that the air which had been in contact with that, which came to equilibrium with that, contained 1.4 parts of nitrogen peroxide per million. And then in this last experiment here where the flour was bleached with 18.6 parts of nitrogen peroxide per million of flour, the air in equilibrium with that was found to contain .6 parts of nitrogen peroxide per million of air. Now, the thing that is made here, the result that is important, is that the parts of nitrogen peroxide found in the air which was in contact with these various flours, that these parts of nitrogen peroxide vary; you see the nitrogen peroxide in the air increases with the amount of nitrogen peroxide used in bleaching the flour.

Q. Does it increase ratably?

A. Here we have 18.6 used in bleaching, and we find .6. Here we have 38.4 and we find 1.4, where you see this is approximately, 38.4 is approximately twice 18.6, and 1.4 is more than twice 0.6. In the next experiment, however, that is about 74, something like four times 18.6—yes just about four times, and you see with 5.0 we have about eight times a little over

eight times 0.6; in other words, the nitrogen peroxide in the air in contact with flour increases more rapidly than the amount of nitrogen peroxide used in bleaching the flour.

Q. Now, from that class of experiments are you able to state whether or not the NO2 remains present as such in the

air mixed with the flour?

A. The fact that we get a changing concentration or amount of nitrogen peroxide in the air in contact with these flours allows us to draw and forces us to draw an important conclusion about the relation between that nitrogen peroxide and the flour. It is a well known physical chemical method of ascer-

taining whether or not we are dealing with a chemical

'981 combination or a solution.

Q. What is the fact here, does the NO2 used to bleach the flour enter into chemical combination in whole or remain in solution in whole, or is it part chemical combination and part solution?

A. The results obtained here show us that we are dealing with a solution. Now, further than that we may show that the nitrogen peroxide which comes in contact with your flour, may be there entirely as a solution in water, or it may be there in part as a solution; it must be there in part as a solution, at all events, it cannot all be there chemically combined.

Q. If the NO2 gets into the flour all chemically combined with bases in the flour to form nitrites by the nitrous acid and nitrates by the nitric acid, would any of the NO2 found in the air in the flour and be subject to be eliminated in the man-

ner that you have described?

A. Please have that question again.

# (Question read by the reporter.)

A. Under those conditions, under the condition that we have the NO2 combined with bases, forming nitrites and nitrates, it would be impossible to remove any of it by this method.

Q. Well, if the NO2 simply came in contact with the water contained in the flour and formed a nitrous acid in solution in the water, would that by means of the methods employed by you come back in the form of gas?

A. Under those conditions it would be possible to remove nitrogen peroxide from the flour and to condense it with the

water to a liquid, a liquid showing nitrous acid.

Q. Before coming here, at Princeton, did you make any studies or investigation to ascertain whether or not nitric reacting material would be found in bread made from flour bleached by NO2? A. I did.

Q. And what did you find in that regard?

A. I found that the bread made from flour bleached by NO2 showed this re-action, that is to say, taking such bread and condensing liquid from it I found nitrous acid in that liquid.

982 Q. Where did you get the flour to make that test?

A. The flour was sent to me from Chicago by Mr. A. L. Winton, and it was—

Q. Designated by some number? A. It was labelled "I S 354 B".

- Q. Before making the bread did you test it by the Griess test for nitrites?
- A. I made a determination of the nitrites in this flour and found 2.47.

Q. Parts per million?

A. Parts per million expressed as nitrogen peroxide.

Q. And in the bread?

A. In the bread made from this flour I found about one-third of that.

Mr. Smith: What are your figures?

- Q. Have you the exact figures, Mr. Smith would like to know.
- A. It was 9, I think I got .3 parts in the million of nitrogen and that would be, expressed as NO2 would be—

By Mr. Smith:

Q. A little less than one part?

A. A little less than one part, approximately one part.

By Mr. Butler:

Q. 2.47 in the flour and .9 in the bread?

A. 0.9 in the bread expressed as nitrogen peroxide.

Q. That may be reduced to the expression of nitrogen by dividing by 3 roughly. Now, did you make any other study or experiment or determination to find out whether or not nitrites would remain in bread made from bleached flour if bleached by NO2?

A. Yes, another sample of flour was sent to me by Mr. J. L. Lynch from Atlanta, Georgia, and this flour was labeled

"I 8 3989 B".

Q. What was in the flour?

A. I found nitrites in the flour, and there was two and a half parts per million expressed as NO2.

Q. And in the bread?

A. In the bread, I will refer to my notes, the bread showed .6 parts per million.

- Q. Did you yourself bleach some flour and ascertain 983 whether or not the bread made from that would contain nitrites?
- Well, we did bleach some flour, some of the Kingston flour, and had soda biscuits made from this Kingston flour, and we found nitrites by the Griess test in the soda biscuit.

Q. Now, by the way, did you try to pump out NO2 out of

soda biscuits?

Yes, we tried to, we put the biscuits in a vacuum and condensed the liquid from it and this liquid, however, did not show nitrites, that is to say, only a suggestion such as we might expect to find in the reagent.

Q. What is the reason for that?

- Because, I think the reason for that is that the nitrites and nitrates were combined with the sodium in the soda biscuit.
- That is, you think the NO2 had attered into chemical Q. combination with the sodium?
  - A. Chemical combination with the sodium.
  - And made the chemical compound of sodium nitrite?

A. Yes, sir.

- And that sodium nitrate was also made and from these chemical combinations you could not pump out the gas or the liquid containing it as you did in the case of the flour and of the bread?
- A. That is a conclusion I drew in connection with that experiment.
- Now, Professor, have you made any ascertainment of the amount of NO2 recoverable by this method as compared with the amount employed to do the bleaching? You have shown here that you used in one instance 18.6 parts of the gas per million to do bleaching, and that the amount recovered is .6, I think that has been covered by your former testimony, hasn't it?
- A. That is the amount of nitrogen peroxide in the air that has been in contact with that flour?
  - Yes. But it is possible to recover more than that; that is qualitative, not quantitative.

984 Q. Yes, sir, now, how may more be recovered?

A. If I should use this vacuum apparatus and put my flour in there and continue it until I had removed all of the moisture from that bread, or all the moisture from the flour, in the neighborhood of 10 per cent of moisture, if I continue the experiment until I have removed all of that moisture, and we can do it that way, then I would get out practically all of the nitrous acid and nitrogen peroxide from my flour, but there is an easier way to do it than that; that is rather a long experiment, and we can do it somewhat more easily in the following way: Taking a glass—

Q. You are now referring to this exhibit?

This Exhibit 26 B, taking a glass receptacle of this kind which the chemists call a desiccator, it is simply a glass container with a top, and around the joint here we put a little fat, that makes it tight, so we can evacuate it, here is a glass tube, and it is a well known laboratory instrument. Now by putting the bleached flour in the bottom of this and over it in a little glass tray a little potash, that contains a little amount of caustic potash which will rapidly absorb nitrous oxid; then by removing this, you see, so as to allow the nitrite to rapidly come up here, it is possible to absorb the nitrites in that caustic potash even more completely than you can by condensing them with the water; and this experiment was carried out, we used 18.6 parts of nitrogen peroxide in bleaching our flour, 18.6 parts to the million of flour, and it was put into a desiccator such [a] represented here, a little caustic potash was placed in a dish above here, and then it was evacuated, and allowed to stand for twelve hours; then it was opened, this dish was taken out and this solution of caustic potash was washed out and diluted, and the nitrites determined in it; then a little more caustic potash was put in, it was put back here and again evacuated and allowed to stand for a couple of days, and then a third time it was opened until we got practically no more nitrogen peroxide, by allowing it to stand in there, and in that

way it was possible to get an idea of the amount of nitrogen peroxide that it was possible to remove from this

particular flour.

Q. Well, now, how did that amount compare with the amount used to treat it, have you the figures on that?

A. Yes, sir, I have the figures on that. The flour was bleached with 18.6 parts of nitrogen peroxide, and I recovered from that, from a 10 gram sample of that flour, from a 10 gram sample of that flour I recovered with the first amount of KH that was put in here, I recovered .0000061 grams of NO2.

By Judge Scarritt:

Q. What would that be in decimals?

By Mr. Butler:

Q. .0000061? A. .0000061 parts of NO2.

By Judge Scarritt:

Q. How much of a gram?

A. Well, that would be sixty-one ten millionths of a gram.

By Mr. Butler:

Q. That was the first amount?

A. That was the first amount, and a little more caustic potash was put in, in a little dish, and it was put in there

a second time, stood for a couple of days, I believe it was two days, and the product I recovered—no, excuse me, I must correct that figure that I gave you, that was one of the test numbers; the first time I recovered .0000398 grams, the first time I recovered .0000398 grams of NO2.

Q. .0000398? A. Three ninety-eight ten millionths—

Q. Of a gram?

A. Yes, sir. The second time I obtained .0000061 grams of NO2, and the third time .0000046.

### By Judge Scarritt:

Q. That is forty-six?

A. Forty-six ten millionths. I am afraid that I will have to correct that first figure again.

## By Mr. Butler:

Q. Your figures do not correspond with the memorandum you gave me.

A. No, the first time it was .0000291—that corresponds, does it not?

986 Q. That is right.

A. The second time .0000061 grams of NO2 and the third time .0000046 grams of NO2.

Q. Which added together?

A. Which added together gave the .0000398 grams of NO2.

Q. Now what percentage of that is, bringing it to the same terms of the total amount of NO2 employed?

A. Therefore I obtained the .0000398 of NO2 from the 10 gram sample of this flour which was bleached with the NO2.

Q. Now when you say the first time, second time and third time, does that mean different parts of the same ten grams?

A. No, the ten grams remained in the desiccator all the time, and the first time I did not get it all out.

Q. Yes.

A. I got the figure that I gave you; the second time I did not get it all out, and the third time I got still some, and perhaps I did not get it quite all out that time.

Q. So that these three quantities all came from the same

flour?

- A. These three quantities all came from the same 10 grams of this flour.
  - Q. And each was a part of the same experiment?

A. Each was a part of the same experiment.

O. Yes, and added together gave you the .0000398?

A. That is correct.

Q. Now what percentage of the 18.6 parts of NO2 employed to do the bleaching was the part recovered?

A. The flour was bleached with 18.6 parts of NO2 per million.

725

Q. Parts of flour?

Parts of NO2 nitrogen peroxide per million of flour; A. therefore in 10 grams there would be .000186 grams of NO2.

Give me that again. Q. A.

In 10 grams of the flour? Q.

Yes, that is right.

There would be .000186 grams of NO2 nitrogen peroxide. A. And you recovered .0000398, approximately .00004.

987 That would be what percentage recovered of the total added?

That is 21 per cent, 20.9 per cent-you may call it 21 per cent or one-fifth.

Have you ever seen an Alsop bleacher at work? Q.

A. I have.

O. When and where?

Well, last Saturday I saw an Alsop bleacher in the Rex mill in Kansas City, Kansas.

O. Is that the Southwestern Milling Company?

A. Southwestern.

Q. Did you see it bleach flour? A. I did.

What kind of flour did you see it bleach? Do you know the brand of it, the name that it is commonly sold under?

I believe it is "Aristos" flour. A.

Now did you take some of the gas after it left the gas generator and passed through a holder,-well, in the first place, I think I will be glad if you will describe the essential features of the plant.

A. The plant consists of a dynamo for furnishing the elec-

tric current and what we may call a generator.

How many gas generators do they have here in this flaming arc arrangement?

A. I do not know just how it is designated but I should call it a double unit, that is there were two arcs.

Well, there was only one generator but two arcs and the generator?

Two arcs in that, they were connected together, so I should call it a double unit; the generator was a 500 volt direct current machine 71/2 kilo-watts, I believe, about a little over a thousand R. P. M.

How far was it from the agitator where the flour was bleached, roughly, you did not measure it?

I think it was two floors below the agitator, and do you wish, shall I describe that too?

Yes, was there a tank between the gas machine and the flour agitator? A. There was,

O. Where was that?

That was on the floor, between the generator and the A. agitator.

988 Q. Yes.

A. The gas or the air was forced into the space where the arcs are by means of two cylinders, and there they were changed by the flaming arc in part to nitrogen peroxide; then these gases pass through pipes, two inch pipes, they seem to be, or two and a half inch pipes, to the floor above, where there was a cylinder; it may have been about 18 inches, something like that, in diameter, and something like 6 to 8 feet in length, and from that cylinder it passed on up to the agitator through two inch pipes or two and a half inch pipes, and into the agitator, and the flour entered at the same end.

Q. Well, was it arranged so that the gas after passing this tank between the agitators and the gas machine, so you could

run some gas to different agitators?

A. Yes, it was arranged—they have four agitators there, and it was arranged so that the gas could be distributed to the four agitators, that is to say, from the 2 inch pipe there were pipes running to each one of the four agitators and there were cocks there to regulate the amount of gas that flowed into the agitator, a pipe for each agitator.

Q. Did you take some of the gas made by that machine?

A. I took a sample of the gas as it was passing into one of the agitators, that is to say about an ounce.

Q. At the time when you took the sample do you know the

amperage that was on?

A. Yes, sir, the machine was running uniformly and showing about four amperes.

Q. And the voltage?

A. Well, it was a 500 volt machine.

Q. And how many agitators were taking the gas through it? A. Four.

Q. Now where did you take the gas?

A. I got the gas-

Q. And tell how. A. From the pipe about a foot before—about a foot before it entered the agitator.

Q. How did you do that?

A. At that point there was an elbow in the pipe, and there was a screw cap, two inch screw cap.

Q. On the elbow?

A. Yes, and it was—before we unscrewed that, we did 989 unscrew it, and then we procured a cap of the same

kind and drilled a hole through it, about a quarter of an inch hole, and inserted a glass tube into that hole and waxed it in, and made it tight with wax, and then we inserted this cap with the glass tube into the elbow of the pipe, and then I used a flask—

Q. Is this it?

A. I can perhaps explain it best this way.

Q. Well, you might as well mark that while we are going along.

(The flask was marked by the stenographer "Government Exhibit 27")

Q. Exhibit 27-go on.

- A. Now this may represent, if you like, the glass tube that I sealed into the hole in the cap, so that this glass tube extended inside of the pipe and outside and was open; then I had with me a flask of this kind.
  - Q. Like Exhibit 27?
- This was one of the flasks that I took with me, "Exhibit 27", and that flask had been pumped out with a mercury pump so that there was no air in it and sealed up hermetically, the glass was sealed so that whenever you break the point, the air will rush in, and you get this volume of gas. On the inside tube, one like this, that was placed through that cap, I placed a piece of rubber tubing, and I put a little bit of cotton wool in that angle of the tubing, so as to filter the air from any dust flour or anything of that kind. Then I put a little bulb on the corner, on the point of this end without breaking it and put this over it, then it was possible with my finger there through the tube, to break that tube, and as soon as I did that, the air began to rush in from the pipe and only from the pipe, so that I obtained a flask full of the bleaching gas. After I had obtained the flask full, holding this bandage, this rubber tube here, and removing it, I then took a little alcohol lamp and sealed it and so it was hermetically sealed, and I brought that gas with me, and it was the gas taken just before it entered the agitator when the apparatus was running under normal conditions.

Q. Now on the same occasion did some other gentlemen who were with you take some gas, after shutting off the cocks running into the other agitators?

A. Yes; Prof. Acree and Dr. Mitchell took a sample or flask from that same tube from which I had taken it.

Q. They took the gas out of the same place that you got it?

A. Yes, sir.

Q. And in the meantime had some of the pipes leading to some of the other agitators been shut off?

A. I believe that that is true.

Q. You did not observe yourself?

A. I did not observe it myself.

Q. Now was there some flour bleached by this machine as it was running at the time when it was running in the same way as it was at the time you took out the gas?

A. The machine was bleaching the flour at the time I took

out the gas.

Q. Did you observe the flour before it passed into the agitator and after it came out, comparing some that had been

through with some that had not been through?

A. Immediately after I collected a sample of gas I collected a sample of flour at the exit of the agitator, and then immediately collected a sample of the flour that was coming into the agitator, at the entrance, that is to say, I got the unbleached flour and the bleached flour immediately after I had collected a sample of the gas that was entering the agitator and everything, as far as we could observe, was running under normal conditions.

Q. Did you take that flour that was so bleached and test it and see whether it contained nitrite reacting material?

That sample was brought back to the laboratory here and analyzed for nitrites and nitrites were found in it.

Q. What amount?

I obtained .55 parts of nitrogen as nitrites per million which would be about 1.8 parts of NO2 per million.

Q. Computed as nitrogen it was about one-half of one

part per million? A. .55. Did you compare the color of the two?

A. I used the regular or the usual method of determin-

ing nitrites or our usual method. 991

- Q. And did you measure the amount of nitrites the same way that you have described as having measured it in the flour seized?
  - The liquid condensed from the flour seized?

Q.

The principle was the same. A.

Now what I am trying to get at, I want to compare your finding in that was two and a half parts, was it, of the flour seized?

Yes, sir, two and one-half parts. A.

That is of nitrogen peroxide, of NO2? That is in the liquid condensed form.

A. Now what I am trying to get at, I want to compare in the same terms the amount of nitrites in the flour seized here in this case, compared with the amount that you found in this flour that you saw bleached?

A. Well, the two and one-half you will remember was the amount of nitrites, nitrous acid I found in the liquid condensed from that flour; that does not represent the amount

of nitrites in the flour.

Q. Well, did you determine the amount of nitrites in the flour seized, did you yourself? A. I did not.

Q. No, you did not?

It has been determined here, though.

A. Yes, the determination was 1.8 by Winton and 2.3 per million, computed as nitrogen, as against .55 of this computed as nitrogen. That is what I wanted. Did you observe any difference in the color of the flour, was it discernible

when you brought the two flours together?

A. It was discernible, that is to say, there was a difference in the color of the sample taken from the exit of the agitator, and the sample taken at the entrance of where it entered the the agitator.

Q. Which was whiter?

- A. The flour that was taken from the exit was the whiter of the two.
  - Q. The flour that went through the agitator?

A. Yes, sir.

Q. Was there much difference-pretty hard to-

A. It was discernible but not very different.

Q. Did you determine the degree of concentration of the gas that was used? A. Yes.

Q. How much NO2 was in your flask?

A. On returning to the laboratory the flask was opened and a little caustic potash was allowed to flow into the flask; by letting it flow on the walls it soon absorbed all of the nitrogen associated in that sample of gas that I collected, the sample of gas that was used in the bleaching. And that was determined with the Griess test and then it was calculated, the parts of nitrogen peroxide in a million parts of air.

Q. How many?

A. I found 300 parts of nitrogen peroxide in a million parts of the air.

By Judge Scarritt:

Q. Of that condensed in your bottle, that you took out of the bottle?

A. No, of the sample of the Alsop gas collected just before it entered the bleacher, I found 300 parts of nitrogen peroxide in a million parts.

By Judge Scarritt:

Q. In that glass bottle? A. Yes.

By Mr. Butler:

Q. That is the degree of concentration of the medium used to bleach the flour in this particular case, am I right about that? A. | Yes, it is.

Q. And you analyzed how soon after bleaching?

A. We got a sample in the morning and the analysis was made in the afternoon, Saturday, last Saturday.

Q. And the amount found in the flour was made the same day? A. Made the same afternoon.

Q. And that was .55 of one part per million computed as nitrogen. Now you said that your determination showed that under normal air, that there was less, how much less you

couldn't tell, than one part per 100 millions of this nitrite reacting material; is that the way I understood you?

A. I believe I made that statement to you.

Q. Well, you made it this morning on the stand, didn't you, that you made some examinations on that question.

A. I don't recall that I made it.

Mr. Smith: You have not reached that point yet.

993 Q. I thought you did say. Well, what is the fact about that, have you yourself examined ordinary atmosphere to determine how much nitric reacting material, if any, discernible is in it?

A. I have this to say, I have an experiment that gives me an idea of the amount, and I also state now that I recall having stated—made a statement about it in explaining those

nitrite experiments.

Q. You did, no doubt about it, and that was that you determined that it was less—that your tests have disclosed one part to a hundred million but that it did not disclose any—

A. Yes.

- Q. So your conclusion is it is less than one part to the hundred millions?
- A. The air then outside of the laboratory at Princeton at the time that we were making the experiments at the time that I made the experiment showed less than one part of nitrogen peroxide to ten million parts of air.

Q. To ten millions or a hundred millions, give me the whole

answer.

A. It is .01 and it is a hundred—I am in error.

Q. Taking hundred millions as the basis this that you found is the Alsop machine that bleached to the degree that you stated would be thirty thousand parts to the hundred millions?

A. Yes, sir, thirty thousand times.

Q. That is thirty thousand times as strong, is that a fair way to express it? A. Yes, sir.

Q. Did you determine how long it took this flour to pass through the agitator out here at this Rex mill?

A. Yes, with the aid of the miller and Mr. Winslow we made a determination of the length of time needed for flour to pass through the agitator where it was being bleached.

Q. How was that done, you better describe that agitator?

A. The flour was passing through uniformly and Mr. Winslow took a handful of middlings or grit, or something of that kind, and threw it in at the entrance of the agitator, and the miller having his hand on the exit was able to detect the—

By the Court:

Q. When it came out?

994 A. When it came out, and I held the watch; the first time I got twenty seconds; the second time the men reversed; Mr. Winslow determined the time at which he first gets the grit coming out below, and the miller put it in above and we got twenty-one seconds perhaps that is greater accuracy than we could claim, but we got those two observations, I should say about one-third of a minute was the time.

By the Court:

Q. What is the length of the agitator, 6 or 8 feet?

A. I should say it was fully 8 feet, and it was a horizontal agitator, there was a shaft running through the middle of it, and there were arms—fans, so when that would come down, they picked up the flour at the bottom and threw it along, threw it up and over it would be thrown along a certain distance, and when another fan would pick it up and throw it again.

Q. So that it was subject to the influences of this nitrogen peroxide gas for about twenty or twenty-one seconds?

A. For approximately one-third of a minute.

At this point the Court took a recess until 2 o'clock p. m.

# Monday Afternoon Session.

Pursuant to adjournment, court met at two o'clock p. m., Monday, June 13, 1910, and proceeded with the trial of said cause further as follows:

G. A. Hulett, being recalled, was examined further, and testified as follows:

## Direct Examination

By Mr. Butler: -Continued.

Q. I intended to ask you, this morning, when we were talking about the gas which you took off the Alsop bleacher, at the Rex Mill, last Saturday, whether or not you could see the color of the gas in the flask.

A. When I took a flask, of the same kind of glass, and the same size, without any—I will say with just pure air in it, and held the two flasks against a white background, it was very plain to see that the flask containing the Alsop gas was slightly reddish in color. It was visible.

Q. Now, as to whether it would be observable, unless pains was taken to make a comparison such as you have described.

A. Well, the glass is not entirely uncolored. It has a slight color to it—the glass has, so it is necessary to compare it with a glass of the same kind, and the same size, so as to be able to detect a difference.

Q. Now, assuming that within about two weeks after the bleaching of the flour which has been seized, which was seized on the night of the 31st of March, and subsequently analyzed at Chicago, about the 12th of April, and in St. Paul about the same time, within a day or two, and the testimony indicates that at Chicago there was a determination by the method employed by Dr. Winton of 1.8 parts per million nitrite, computed as nitrogen, and by Mitchell, at St. Paul, 2.3 parts per million, computed as nitrogen, and in the flour which was bleached under your observation, Saturday, at the Rex Mill in this city, your determination was .55 of one part per million, computed as nitrogen, and the determination of the quantity of gas in the air was 300 parts per million. New, on that basis of facts, are you able to express to us an opinion as to the concentration of the gas used by the manufacturers of the flour that was seized at the time they bleached this flour that has been so analyzed?

A. Well, if the conditions-all other conditions are the same, all other conditions than the concentration of the gas with which you are bleaching-if all the other conditions are the same, it would require something more than a proportionally greater concentration. In other words, I found here 300 parts of nitrogen peroxide in the Alsop bleaching gas,

as it went into the agitator, and the flour passing 996 through there, with that gas, was bleached .55 parts nitrogen per million. Now, if we were to have a greater bleaching, we would have to have more concentration, more than 300 parts nitrogen peroxide in our Alsop bleaching gas, and if we wished to double the bleaching, and have twice the bleaching from the results I gave this morning, we would have to have twice the concentration. In other words, if we wanted to have three times the amount of bleaching, and the seizure

flour has approximately three times the amount of bleaching. then we would have to have something over three times the concentration of nitrogen peroxide in the gas that did the bleaching. 1.8 is about three and one-third times .55? A. Yes.

That would indicate about 1,000 parts per million? Q. I would conclude that, if the rate of passing the flour through their agitator was similar to this experiment that I observed, that the Alsop gas used in this bleaching of this seizure flour must have been something over 1,000 parts in a

million, of nitrogen peroxide.

Q. Now, referring again, to one matter I neglected to ask you about, showing the amount that you recovered by the KOH method, in the instance that you treated the flour by 18.6 parts per millien, you recovered, you say 20.9 per cent of the amount employed? Is that right? A. That is correct. Q. Now, I want to find out, assuming that you recovered it all, the full, theoretical amount, how much would be recovered?

A. If the nitrogen peroxide dissolves in the water in the flour that is on the surface of the little grains of flour, it forms nitric and nitrous acids, we will say, in chemically equal parts. We would have, then, one chemical equivalent of nitric acid, and one of nitrous. Now, in this method, removing the nitrous acid in a vacuum, as I have employed, if we could remove all of that nitrous acid, and, employing the KOH method, I might expect to have one-fourth as nitrite, in the KOH—

a fourth of the amount that was originally added to

997 the bleached flour.

Q. But, in this Figure A, on Exhibit 26, by your three draws you succeeded in getting about 21 per cent—20.9?

A. Approximately 21 per cent.

Q. Now, if you get it all, it would have shown 25 per cent of NO2, as I understand it.

Mr. Scarritt: Theoretically?

By Mr. Butler:

Q. Theoretically.

A. On the assumptions that I have made.

Q. Yes, that is what I mean. So that you counted it about eighty-one and one-fourth per cent of the full, theoretical amount? A. Approximately that, yes,

Q. From your examination, are you able to express an opinion which acid it is—that is, the nitrous, or the nitric, or whether both of these acids operate to bleach the flour, to re-

duce the color to white?

A. In this experiment we have referred to, where the flour was bleached with 18.6 parts nitrogen in a million, I removed practically 21 per cent of that nitrogen peroxide, and after the flour was taken out of there, I compared it with some other of the original-some that I did not put in the vacuum, and I could notice no difference in color. In other words, after removing practically all of the nitrous acid, the flour, as far as this color is concerned, was the same. Consequently, I would be inclined to say from that, that the nitric acid, rather than the nitrous acid, did the bleaching, because, after removing the nitrous acid, the flour was still bleached, and, in connection with that, we did an experiment in which we had a dilute solution of nitric acid. We took pure nitric acid, as we could, so as to have it as free as possible from nitrite, and I shook the flour up with that acid, and we shook up a sample of unbleached flour with water, and then we

filtered both of them, and compared the two. The one which was shaken up with nitric acid showed distinct bleaching, so, all together, I am inclined to say that it is

the nitric acid that does the bleaching.

998

At any rate, you know that nitric acid will bleach flour?

Nitric acid did bleach flour, in this experiment,

Q. And, when you drew off eighty-one and a quarter per cent of the total, theoretical amount of nitrous acid, the flour still remained the same color?

That is correct. The flour was still bleached.

Now, as respects the effect upon flour treated with nitrogen peroxide gas, mixed with atmospheric air, can you tell us whether or not there is any difference in the effect upon the flour, depending upon the means of producing the nitrogen peroxide gas-that is, whether it is produced by chemicals,

the flaming arc, or otherwise?

A. I should say that, in general, there would be no difference. Nitrogen peroxide, if it is nitrogen peroxide that does the bleaching, as my experiments indicate, it is immaterial whether you prepare it by the flaming are, or whether you prepare it by reducing nitric acid, or any other way you like. When you get your nitric acid of a common concentration, and bleach your flour with it, you get the same result.

Q. And as to the chemical changes in the flour, if any, other than the effect upon color. Will those changes be the same, if nitrogen peroxide be used under the same circumstances, without any regard to the source of the production of the nitrogen peroxide gas? I am not sure that I make my

question clear.

A. Your question is perfectly clear. However, it might need a little explanation. If there was nothing else introduced into the air, at the same time, that would affect the reaction, it would be the same.

Yes? That is what I desire to have you assume. 0.

A. Yes.

Q. The conditions exactly the same, except that in one instance the nitrogen peroxide gas is the result of the 999 flaming arc, and, in another instance, it is produced as the result of the use of chemicals, like nitric acid decom-

posed by electrodes, or the action of nitric acid upon soft iron, as in one of the processes which is here described. Now, with that assumption, you say the changes would be the same?

The changes would be the same.

Now, as to the effect, as to whether or not the effect upon the flour bleached by the Alsop process, would be comparable with the laboratory method of applying the nitrogen peroxide, which has been described here, by some of the witnesses, as in essential particulars, the placing of the relatively small amount of flour in a large bottle, and then, after the introduction of the nitrogen peroxide into the air above the flour in the bottle, then shaking it for a time?

A. I should say that there would be no other difference than that due to a possible difference, if we have different concentrations of nitrogen peroxide in the gas used for bleach-

ing.

Q. Now, as to the method you saw employed in this particular agitator, down there. As I understood you, this agitator was cylindrical in shape, in 18 inches to 2 feet in diameter, and 8 feet long, or such a matter, speaking roughly.

. That is my estimate of it.

Q. And which end was the nitrogen peroxide gas introduced into?

It was introduced the same end the flour was introduced into it.

Q. And I understood you to say that there were wings, that I got the impression—I don't know that you said that, —but, they were screw shaped.

Mr. Scarritt: Fans.

By Mr. Butler:

Q. Screw shaped, but not continuous? Is that the idea?

1000 A. I gathered that impression. I didn't get a good chance to see the inside of it, but that is what I understood.

Q. Now, as to the length of exposure to the same quantity of nitrogen peroxide gas. For example, what I am trying to get at, is, whether there would be any substantial difference upon the flour, which you saw bleached, assuming that the same amount of bleaching medium was used for the flour, moving more rapidly, or more slowly, or differently.

A. I regard it as merely a question of time that the flour

is in contact with the gas.

Q. How long would it take for the flour to take into itself, either in solution or chemical combination, the gas employed?

A. I have no quantitative information on that point, but my experiment in bleaching flour, where I introduced the gas in a flask, it showed me that the gas was taken up very rapidly, indeed.

Q. Now, when you say "very rapidly indeed", what do you mean?

A. I mean this, that in my experiment, I had a flask with 500 grammes of ordinary flour, and I introduced one cubic centimeter at a time, and I could see a red gas form, as long as the gas went in there, and then, on once shaking it,—just giving it a quick shake, it disappeared, so far as vision was concerned, so, it indicated to me that it was absorbed very completely and very rapidly. I should say probably less than a second—distinctly less than a second. That is to say, provided you have your flour thrown up through the atmosphere.

Now, does the degree of bleaching, or the amount of bleaching, depend in any degree, in your opinion, upon the concentration of the medium?

It certainly does. It is, roughly speaking, proportion-

ed to that, although not quite proportioned to it.

Now, the concentration of the medium from an Alsop machine, such as you observed, depends upon what elements?

A. Well, as I observed that machine, it seemed to me that it was running uniformly, and preparing about 1001

the same amount of nitrogen peroxide, in a unit of time. That is to say it was preparing a given amount of nitrogen peroxide in a unit of time. Now, if you pass a certain amount of gas through the boxes where this is formed, you would get the nitrogen peroxide, in that gas. If you passed a foot through—a cubic foot, you would have had, in that, cubic foot the gas formed in the unit of time. Now if, in that same unit of time, you passed two cubic feet through there, I should say you would have it in two cubic feet, or half the concentration.

Q. Well, it would depend upon the power of the current, and frequency of the arc, and flame?

Yes, it varies with all those factors. A.

And would depend largely upon those factors, would it Q. A. Yes, it would depend on those factors. not?

There might be some others, but at least on those? 0.

Yes. A.

Now, for example, suppose you shut off the outlet, from the expansion tank, we will call it—is that a good enough word for this tank in the middle (to Mr. Smith)?

Mr. Smith: Suits us, if it does you.

By Mr. Butler:

Suppose you shut that off, beyond the expansion tankshut off the escape of air, and continue to run the machine, what effect would that have upon the degree of concentration?

A. If I understand your question, or your description, it would decrease the rate at which the gas was flowing through the system, and, consequently, if you are forming nitrogen peroxide at the same rate, that would increase the concentration of the nitrogen peroxide in the air.

Q. And, suppose that the flow from the expansion tank, or from the gas generator, was obstructed by shutting off an outlet, or turning a valve part of the way, or by a sharp turn

in the pipe, or any other manner of obstruction, how would the concentration of the medium then compare 1002 with the same, if the outlet of the medium was relatively unobstructed—that is, a straight pipe, and the like?

A. The obstructed flow, the rate of flow is less through the system, and the concentration of the nitrogen peroxide in the

gas becomes greater.

Q. Then, whether or not, under conditions such as you saw, where it was possible to have several outlets, with various agitators, or only one, then, I would like to have your opinion whether or not these conditions would vary the degree of concentration of the medium. A. Yes, they certainly would.

Q. If it was all shut up, and it all had to pass through one

valve-

A. (Interrupting) That would restrict the flow through the system, and I would expect greater concentration of the

nitrogen peroxide in the gas.

Q. Do you know whether or not this flaming arc, the making and breaking of contact between two electrodes connected with sources of electricity, is employed for the commercial

manufacturing of nitric acid?

A. Yes. The flaming arc is being used very extensively, at the present time, to prepare nitric acid from the atmosphere, particularly in Norway, where they are preparing it on a commercial basis. There is one concern there, the Berkland-Eyde Company that, this year, is making something like 20,000 tons of nitric acid by the flaming arc, in air, and, this next year, the amount of horse-power—electrical horse-power that they have, would indicate that they will multiply that output by ten. There is another large German concern, that is also manufacturing it, on a large scale, from the air, by means of the flaming arc, manufacturing nitric acid.

Q. Now, the concentration of NO2 with atmosphere employed for the manufacture of nitric acid on so large

a scale,-what is that?

1003

A. In the manufacture of nitric acid with the electric arc, of course, the important thing is to get as large a yield as they can from their electrical energy, and they are able to get a concentration of nitrogen peroxide of about 15,000 parts in a million parts of air.

Q. Then, for the purposes of comparison, your determination was that there was less than one part NO2 to the hundred million in normal air?

A. In normal air there is less than one part nitrogen peroxide to 100 million parts of air.

Q. And that the air, in bleaching flour, which you treated by 74 parts to the million, of NO2, you told us contained 5 parts to the million?

Q. That is, according to the air, in contact—the equilibrium with that flour, containing nitrogen peroxide.

That would be 500 parts to the same hundred million?

A. Yes.

And, on your estimate that the flour, bleached by the claimant here, and which was seized and analyzed, was 1,000 parts to the million in the gas that bleached the flour-

(Interrupting) That's the estimate that I made.

That would be 100,000 parts to the hundred million, and, in the commercial manufacture of nitric acid, it is 15,-000 parts, or fifteen hundred thousand parts to the hundred

million? A. That is correct.

Q. If the nitrous acid formed in the flour by the bleaching process combined with a base like sodium, or calcium, or magnesium, in the flour, you may tell us whether or not this pumping method which you employed would release from the nitrite of sodium, or potassium, or magnesium, as the case

may be, the nitrous acid so chemically combined.

A. No, it would not. 1004

Now, in the case of the biscuit made from the bleached flour, I understood you to say that you could procure none of this nitrous acid by the pumping method.

A. From the biscuit made from the bleached flour-the

soda biscuit?

Q. Yes.

I was unable to get nitrite tests, excepting the merest traces, in the liquid condensed from this biscuit, or pumped out of it.

And that was because of the chemical composition? O.

A. Because the nitrogen peroxide was chemically combined with the soda. That is the reason I have for not getting it, in that case.

Q. Do you know whether or not this mill, called the Rex Mill, which you saw, was regularly bleaching for commercial

purposes?

No. When I went there, as I remember it, the bleacher was not in operation, and I understand that they were not regularly bleaching. They did this as an experiment, and I asked them to run it under normal conditions, and they let it run a considerable length of time, before the experiment was made.

Q. Your understanding is that the "Aristos" flour is not

a bleached flour?

A. Is an unbleached flour. I had a sample of the "Aristos" flour, and found it did not contain nitrite.

Q. How did you get that bread into that bottle (indicat-

ing)?

A. Well, this thing was made, here, in the laboratory. This was just an ordinary flask,-round bottomed flask, and opened here. I put the bread in. I first sealed on this tube, here, and then this tube, and put the bread in, and then I sealed that, after the bread was in, with a little bit of a finepointed flame. It is simply a matter of glass blowing. It is easy to blow a thing of that kind, if you have had the experience.

Q. By the way, did you treat "Aristos", or any of the unbleached flour that you got, for nitrite reacting material, in that sort of a thing, to find out whether it would give the color

tests, such as is shown by Exhibit 21 and 20?

A. I obtained a sample of unbleached flour Mr. Lynch brought me—Mr. Walsh brought the sample. Mr. D. M. Walsh. It was Number I. S. 12,386-B, Kelley Milling Company, patent, pure white flour, Kansas City, Missouri, and claimed to be unbleached. I tested the flour, and found nothing but traces of nitrite in it. It was a question of whether there was a trace. I put that flour into one of these flasks, pumped out all the air in the flour and then I condensed the liquid from that flour, and added the Griess test. Now, when I added it, I got a little bit of a faint trace of nitrite, but very slight.

Q. The water came down clear? A. Perfectly clear.

Q. Now, which did you apply this to?

A. I. S. 12,386-B.

Q. Government Exhibit 28 is the one to which you added the Griess test? A. Yes.

Q. And Exhibit 29 is the condensation from the very same

flour, to which you did not add the test?

A. The liquids were both condensed at the same time, from that particular sample of flour. I divided it into two portions. To this portion, I added the Griess test. To this, I did not, and there is a slight suggestion of a trace of color to this. I don't know that it is really visible, now. I cannot say that I can see any color there.

A Juror: Can you put the Griess test into this other one, now?

The Witness: I can do that, yes. If it is allowable, I would be glad to do it. We have the Griess test here.

1006 Mr. Butler: That is for the court to say.

The Court: How is that?

Mr. Butler: The situation is this, may it please Your Honor. Exhibit 28 and 29 are condensations from the same batch of flour, and the total condensation was divided, and, in the portion contained in Exhibit 28, the Griess test was introduced. It has not been introduced in the portion contained in Exhibit 29, and the juror, Mr. Harmon, asks whether or not there may now be introduced into the Exhibit 29 some of the Griess test.

The Court: It would have to be by agreement on both sides.

Mr. Smith: We will make no objection.

Mr. Butler: We make none.

The Witness: It has already been added to this one.

By Mr. Butler:

Q. Is that bottle which is marked "Exhibit 23" the Griess test? That is the Griess test, is it not, Doctor, which you used this morning to test the fluids from the seized flour, and from

bread made from the seized flour?

A. Now, you can observe no color, there, after adding the Griess test, I might say. The color does not develop immediately, particularly in very dilute solutions. I believe, probably, in about ten minutes, though, you will get color. But I think probably it will take that long to develop the color.

What number is that?

That is Exhibit 28, as I read it. And this other one, to which I have just added it, is Exhibit 29. Now, in the course of probably ten minutes, the color will develop.

Do you happen to have any of the liquid, taken from the bleached flour which was seized in this case, to 1007 which there has been applied any of the Griess tests?

No, I have not. I have put Griess tests into all of it, but I have some liquid, condensed from this bread, to which I have not added the Griess test. That liquid in there (indicating) was condensed from that bread, and I have not added it.

Q. Is it hard to get that out into a tube like this?

A. No. I could add the Griess test, right there, if I had a little file to open the upper tube.

(Witness adds the Griess test to the liquid referred to.)

A. (Continuing) Now, here, again, it is necessary to wait a few minutes for the color to develop.

Q. When the dilution is relatively strong, with nitrite reacting material, does it take long for the Griess test to show the color, indicating the reaction?

A. If you have a strong solution of sulphurous acid, it would come immediately, as soon as you put it in there.

Q. Sulphurous acid?

A. Nitrous acid, I mean. If you have a dilute one, it will take longer and longer to appear.

Mr. Butler: Now, in the meantime, I think it would be well to mark this thing as an exhibit, don't you,-this whole apparatus?

Mr. Smith: I suppose so.

Is this your private property?

It belongs to the Pure Food laboratory, and the glass, I made up myself. I have no care for it, though.

Mr. Butler: Then, I guess we will have it marked.

The apparatus referred to was then marked "Government's Exhibit 30".

Q. Now, this fluid in the tubes, which is a part of Exhibit 30, and Exhibit 30 being the apparatus which you used to pump this stuff out of the bread, is a part remaining after you had taken out the fluid which is contained in this tube which you sealed up, and is marked "Exhibit 21", and which you treated before going upon the stand this morning, is it?

Yes. This liquid is some that I took from that portion,

there, to which I have just added the Griess test.

Mr. Butler: You may cross-examine.

### Cross-Examination

By Mr. Smith:

Q. In your examination of these flours, and in your experiments have you been able to extract any nitrogen peroxide, as such, and get is isolated by itself?

A. Nitrogen comes from it, and distills and condenses with

the liquid, there.

Q. Well, pardon me, I am not asking you anything about a distillery. I am asking you whether you have been able to get it separated by itself, from any of this flour which you have examined.

Mr. Butler: Just a moment. I ask that the witness be permitted to answer that question that he started to answer.

Mr. Smith: I think he can answer yes or no. He can explain later on, the reason, if he wants to, and Mr. Butler will give him a chance. That is a very plain question.

The Court: You want him to answer yes or no?

Mr. Smith: Yes, sir.

The Court: All right. Answer yes or no, and then, if Mr. Smith declines to let you explain, later on, you may explain.

The Witness: Will you please read the question?

Question read.:

A. May I ask a question?

1009 By Mr. Smith:

Q. No. You can answer the question.

Mr. Butler: Wait a moment.

By Mr. Smith:

Q. If you don't understand the question, you can say so.

A. I don't understand the question as it is.

Q. All right. Have you been able, in your examinations of these flours, or your experiments, to get any nitrous acid, as such, separated from the flour, or from the bread?

A. Separated from the flour and from the bread, yes, sir.

Q. You got it isolated by yourself? A. Yes, sir.

Q. Have you any of it here?

A. I had some there. There was some right there in the tube, to which I put the Griess test.

Well, that is combined with the water, is it not?

A. No, sir, it is not combined with water.

Is that pure nitrous acid in that? Q.

That is nitrous acid. A.

Q. Haven't you also got all the moisture that was withdrawn from the bread in that tube, or didn't you have it all, there? A. Not all that I drew off, is there.

Q. Well, in combination with that, was the water,-the

moisture that was in the bread? Is that not true?

A. Combination with what?

I didn't say "combination" at all. Then you had in this tube all the moisture that you could draw from the bread? Is that not true?

A. Not all I could draw from the bread. I can still draw

some from it.

1010

Q. Well, you had some water that you drew from the bread,

did you not? A. Yes, sir, possibly.

Then, in this moisture that you drew off, or in this liquid that you drew off, what proportion of that was nitrogen peroxide?

A. There was in that liquid, according to my analysis,

1.2 parts nitrogen peroxide per million.

Q. Per million? In a million parts of water?

A. Yes, sir.

You would have 1.2 parts nitrogen peroxide? Q.

Nitrogen peroxide. Not as such, no. I would not answer that, exactly that way, without explanation.

Q. Well, not as such. Then, as what?

A. As nitrous acid.

Q. As nitrous acid? All right. Then, in a million parts of this fluid, there was 1.2 parts nitrous acid, was there?

That is correct.

Q. It came that near being pure, did it?

A. What is it?

- Q. It came that near being pure nitrous acid, that, in a million parts of it, there was only two parts nitrous acid?
  - A. What do you mean by pure nitrous acid?
     Q. I don't know. I am trying to get your idea.

A. I don't know that I can tell you that.

Q. In a million parts of this liquid, though, you had 1.2 parts nitrous acid, did you? A. Yes.

2. And it was in that state of dilution? A. Yes, sir.

Q. Now, let us see if we can get it so we will all understand it. In a million drops of water, or a million drops of this fluid, you would have had 1.10 drops of nitrous acid?

A. That assumes that the density of the nitrous acid and the water are the same. Nitrous acid is not known, as such.

Q. Well, you say you had it in that state of dilution, did you not? A. I said parts by weight.

Q. Well, in a million ounces of it, by weight, you would

have 1.2 ounces of nitrogen peroxide?

A. 1.2. This is from the flour. That is correct.

- 1011 Q. Now, can you give us the relative proportion, in volume?
  - A. I cannot, because I do not know the density of HNO2.
- Q. You are not able to tell, then, what proportion, in volume, would be the nitrogen peroxide?

A. I am not able to tell it, no, sir.

Q. But, in weight, it would be 1.2 out of a million?

A. 1.2 out of a million.

Q. Now, in that flour that you examined, that was sent you by Mr. Winton, you gave your figures as 2.5 parts per million, you say, as what? A. Nitrogen peroxide.

Q. Or nitrite, which?

A. Nitrogen peroxide. I think I gave all my results as nitrogen peroxide. I intended to—parts per million.

By Mr. Butler:

Q. That is, unless expressly stated to the contrary?

A. Yes.

By Mr. Smith:

- Q. That would be, measured as nitrogen, how much?
  A. Oh, approximately one-third of that. Divide it by 3.3.
- Q. All right. Measured as nitrogen. I use this term, because I think that is the term Mr. Winton used, when he gave us his analysis of it. Measured as nitrogen, you found one-third of 2.5? A. Yes.

Q. Which would be about eight or nine-tenths of one per

cent?

- A. You divide it by 3.3, so it would be seven something.
- Q. It would be .7? A. I think it would be about .75.

In other words, in a million parts, you found less than one part of nitrogen peroxide?

No. We are talking about nitrogen.

Or nitrogen, I mean. A. I found .75 nitrogen. Q.

Less than one part of nitrogen? A. Yes. Q.

Now, I think Mr. Winton said he found 1.8 parts of Q. nitrogen. How do you account for the difference?

A. I think there is some mistake there. Mr. Winton's 1012 letter to me stated-

Q. (Interrupting) Oh, I don't care anything about his letter to you. I am talking about his testimony on the witness stand. If he found 1.8 parts of nitrogen, and you found .75, as nitrogen how do you account for the difference, or, can you account for the difference?

A. I am not going to account for the difference. I don't

understand that that was his analysis.

Mr. Butler: Well, Mr. Smith, aren't you in error in your statement. Didn't Mr. Winton's quantitative determination compare with the volume of the flour, and doesn't Professor Hulett's compare with the volume of the liquid.

Mr. Smith: No, sir, I am not asking about that. I am asking about the flour, now.

The Witness: May I ask what flour it is?

By Mr. Smith:

Q. That which Mr. Winton sent you. Didn't you examine

the flour he sent you?

A. I examined Sample I. S. 354-B, and I obtained .75 parts nitrogen, as nitrite, or, about 2.47 NO2.

Mr. Butler: That was at Princeton?

The Witness: That was at Princeton.

Mr. Butler: Mr. Smith, let me explain that.

Mr. Smith: I wish you would not be so nervous, when I am trying to hurry along with this.

Mr. Butler: Well, I know you have been very expeditious. all the way through, but one specimen, which was taken from the court room only a few minutes ago, long before this flour was made, was sent to him, at Princeton. He is talking of that one, and not this one.

Mr. Smith: So am I.

Mr. Butler: But Mr. Winton did not testify that he examined the flour that he sent to Princeton, at all.

Mr. Smith: Mr. Winton said he sent one sack to Washington.

Mr. Butler: But the flour that he sent to Washington, Mr. Hulett never saw.

Mr. Scarritt: He said there was 1.8 in this flour. That is my recollection.

The Court: Well, I never before have understood the rule to be that one witness must account for another witness's evidence.

By Mr. Smith:

- Q. Well, now, coming to the flour which was sent you by Professor Winton, and which you examined at Princeton, will you give me the amount of nitrogen which you found in that flour?
  - A. I found .75 parts per million.

Q. Less than one part per million? A. That flour was-

- Q. (Interrupting) All right. You have answered my question. Now, don't get on the side issues. We are trying to hurry this up. Now coming to the flour which you tested here, and, as I understand, that is a part of the flour you obtained, here, in the court room. A. Yes.
  - Q. Now, how much did that contain, of nitrogen?
  - A. I did not analyze that flour for nitrogen, or nitrite.

Q. You did not do anything with that?

- A. I extracted the liquid from it, condensed it from it and examined that liquid.
  - Q. And what was the liquid? A. 2.4 parts NO2 per million.

By Mr. Butler:

Q. Million of what?

 Nitrogen peroxide, per million parts of the liquid condensed.

1014 By Mr. Smith:

- Q. How much of the flour did you condense, into that liquid?
  - A. How much of the flour did I condense into the liquid?

Q. How many ounces of flour did you put in?

A. I put in about a pound of flour. Q. And how did you condense it?

Mr. Butler: He did not condense the flour,

Mr. Smith: Oh, now, my dear sir. I wish you would just let the witness and myself go on, and we will get along fine, and get through in a few minutes.

Mr. Butler: I don't like to see you make a fool of yourself.

Mr. Smith: Now, don't disturb yourself over me. I am responsible for what I do.

Mr. Butler: I am glad of that.

Mr. Smith: Well, there are others.

Q. Please tell me your condensation method, and what you did.

A. I put that flour, about a pound of it, in a flask similar to the glass there, a flask holding something over a quart, or something about that, and there was a side tube from it, and a tube extending out, with a glass cock, and I evacuated that. I removed all the air from the flask, and from the flour, and, after I had done that, I put a cooling tube on the outside of the tube, condensing the liquid from the flour.

Q. And did you get all of the moisture out of the flour into

that liquid?

A. I should say distinctly not.

Q. Did you get all of the nitrogen peroxide that was in the flour into that liquid? A. No.

Q. What portion of it did you get?

A. I didn't take it all out, so I cannot say, at all.

Q. What, in your judgment as a chemist, did you get?

Q. Well, I condensed, there, altogether, about 25 cubic tentimeters, I believe.

Q. Now, couldn't you have determined the quantity in the flour, just as well by testing it, as by testing the liquid?

A. Please repeat the question. The amount of what in the flour?

Q. The amount of nitrogen-nitrogen peroxide,

A. I could not determine the amount of nitrogen peroxide that would be in the liquid, by examining the flour, no, sir.

Q. Now, give us, in your judgment, about the amount of nitrogen peroxide that was in that flour, can you?

A. Not from that experiment, no, sir.

Q. Then you are not able to give the jury any impression, at all, as to the amount of nitrogen peroxide that was in the flour that was seized, except as a mere guess?

A. I can give an estimate of it.

Q. Yes, but it would be just guesswork, wouldn't it?
 A. It would depend upon what you mean by guesswork.

Q. You have no accurate knowledge?

A. Not the quantitative determination, no, sir.

Q. You never made a test of the flour, to determine the amount in that, and you cannot tell, the amount there was in it; is that right?

A. Not from my own determination, no, sir.

Q. How long did it take you to condense this fluid that you condensed?

A. Well, in that particular experiment, I think that it took
 I can't tell you exactly. It took over twelve hours.

Q. Well, tell us, now, why did you do that, instead of testing the flour, to determine the amount in it?

A. For the simple reason, by that method I can say that nitrogen peroxide, and nitrous acid, is in the flour, as such.

Q. Couldn't you tell by any other method? Now are there any other compounds besides nitrites, or nitrous acid, that give the red colors, on the application of the Griess reagent?

A. Not that I know of.

1016 Q. None other?

A. Not that I am acquainted with.

Q. Where you could apply this Griess reagent, and get the

same discoloration?

A. My understanding of that is this: The Griess reagent contains two compounds, two organic compounds. When they are in solution, if brought into that solution nitrous acid, you will form a well known compound, or a fairly well known compound, called azo-dye, that is the intense coloring matter. Now, unless you bring nitrous acid in there, you will not get it. You will not get that particular substance, that gives that color.

Q. No other chemical on which it will give that reaction?

- A. I think you will not be able to form that azo-dye with any other substance.
- Q. I am not asking you about azo-dyes. I am asking you if there is any other chemical, on which you would apply this Griess reagent, that you will get that discoloration.

A. Repeat that question.

(Last question read by the reporter.)

A. Not to my knowledge, no, sir.

Q. Now, when you were baking the bread on which you performed this experiment, what sort of heat was used?

A. Which bread? On that particular bread? I don't know

that. I got that from Miss Wessling.

Q. You had nothing to do with the baking of it?
 A. I had nothing to do with the baking of it, no, sir.

A. I had nothing to do with the baking of it, no, sir.
 Q. Do you know anything about the amount of water that

was used? A. I do not.

Q. Or whether the water was tested for nitrites, before it was used? A. I had nothing to do with the baking.

Q. And you don't know how long it was allowed to raise, or the process by which it was made?

A. I know nothing about the baking of the bread,

Q. Do you know what is the effect of yeast upon the 1017 flour which contains nitrites?

[Q]. The effect of flour on yeast containing nitrites? I have no knowledge, from my own experiments on that subject.

Q. As a chemist, what would you say about the effect of yeast if mixed with bleached flour?

A. Mixed with bleached flour, on the nitrates, or nitrites?

Q. Nitrites.

A. I should say it would depend upon the yeast you used.

Q. Well, if you used the ordinary yeast, such as Fleischmann's yeast.

A. Fleischmann's yeast? Well, Fleischmann's yeast is not a particularly pure yeast, as I understand, and it may, itself, use up the nitrites.

Q. You don't know whether it would or not?

A. What is it?

Q. You don't know whether it would or not?

A. I do not.

Q. Now, this bread that you put into this bottle, and from which you drew the extract. Do you know how long that bread was exposed to the air before it was put in here?

A. I can give you the date which I put it in, and Miss

Wessling can give you the date it was baked.

Q. Well, I am asking you if you know?

A. I do not. I suppose about a day.

Q. Exposed to the moisture of the atmosphere for about a day, before it was put in there?

A. I should think it was probably about a day. I cannot

say exactly about that.

Q. Now, what would you say, as a chemist, as to whether or not the bread in that tube would or would not absorb a certain amount of nitrites from the air?

A. Well, just what do you mean by "a certain amount of

nitrites"?

Q. Well, I think that is plain enough. Read the question, please.

(Last question read by the reporter).

A. I should say, in my opinion, the amount of nitrites absorbed by the bread from the air during that time would not be measurable.

1018 Q. Do you say it would or would not absorb any?

A. It would not be measurable.

Q. That is, it may absorb some, but it would be so small you could not measure it?

A. I say it would not be measurable.

Q. Explain what you mean by that.

A. It would be so small you could not measure it.

Q. You do not say it would not absorb any? There are nitrites in the air, are there not?

A. Depends upon what you mean by the air.

Q. Have I got to explain to you what I mean by air? Generally, it is that which we breathe, here in the West.

A. If you mean gases, excluding liquids and solids, there are no nitrites, I believe, in the air.

 Well, I mean that which you are taking into your lungs, as you are there on the witness stand.

A. Well, there might be nitrites in them.

Q. Well, what is your judgment as a chemist, as to whether there are or not?

A. Well, we find nitrites pretty generally in those, and as long as we are taking in those, I think there might be—I think probably there would be nitrites.

Q. Have you made any tests of the air, in places, to determine the presence or absence of nitrites in it? A. Yes, sir.

O. You have found it in the air, haven't you?

A. I have not.

Q. In the East, or in the West?A. In Princeton, New Jersey.

Q. Have you ever made any examination of it in Missouri?

A. I have not.

Q. You heard Dr. Marshall's testimony in regard to the amount of nitrites which he-found in corn starch, which it took up from the air, did you?

1019 A. Yes, sir.

Mr. Butler: Alkaline corn starch?

Mr. Smith: Yes, alkaline corn starch, such as we gat.

Q. You heard his testimony, about the amount that it took up, did you not? A. Yes.

Q. And that was in the atmosphere? A. Yes, sir.

Q. Then if bread was exposed to the atmosphere in which there were nitrites, would not the bread take up a certain amount of it? A. Not necessarily, no, sir.

Q. Well, I am not talking about [—] it would necessarily do,

but what it would actually do.

 If it was acid, I don't believe it would, enough that you could measure.

Q. Did you ever make any examination of bread that was baked from unbleached flour, and baked in a gas oven?

A. My examinations have been of bread baked in a baker's oven, at Princeton, New Jersey, from unbleached flour. That oven is heated, I believe, by coal. It is a long, baker's oven, and all of my experiments have been made on bread baked in that oven, except this sample, here that Miss Wessling made.

Q. Did you ever make any examination of the bread that was prepared in a kitchen, where they used coal as a fuel?

A. I stated that all of my experiments on bread were made on bread baked in that oven. It is Mr. Dohm's bakery, in Princeton, New Jersey, and it is a bakery. Q. Do you know what would be the effect upon the atmosphere in a room where soft coal was used as a fuel, as to whether or not it would impart nitrites to the atmosphere?

A. It would probably impart some nitrites to the atmosphere. Well, I will not say nitrites. I would say nitrogen peroxide.

Q. What would be the effect upon the atmosphere in a kitchen, if they used gas jets to furnish the light?

1020 A. Well, you mean from the standpoint of nitrogen peroxide?

Q. Oh, certainly. That is what we are investigating here.

A. It would impart some nitrogen peroxide.

Q. And if bread were made in that kitchen, would it take up some of the nitrogen peroxide thus imparted to the air?

A. Not necessarily, no.

Q. I am not talking about the necessarily part of it; I want the actual facts. It may not be necessary for it to do that, but I want to know if it would.

A. I could not tell that, unless I had some information

about the bread.

Q. All right. If you don't know, that settles it. Now, in the experiments which you made in your laboratory at Princeton, you bleached some of the flour yourself, did you?

A. Yes, sir.

Q. Now, I wish you would give me the degree of concentration, or the relative proportion between the nitrogen peroxide, and the air that you used, in your bleaching process.

A. I used a two liter flask, and I took about 500 grams of

the air-

Q. (Interrupting) 500 grams of air?

A. 500 grams of flour, and I introduced nitric oxide, NO, one cubic centimeter at a time, and as soon as it came into the flask, it formed, at once, NO2, and then, as soon as it was

in there, I shook the flour, shook it vigorously.

Q. Well now, you will pardon me if I interrupt you. I don't understand anything about what that means. You testified, that, out here at the mill Saturday, you found the air, there, that was performing the bleaching, there was 300 parts of nitrogen peroxide to a millionth part of air, did you not? A. Yes, sir.

Q. Now, what I want to know is, in the bleaching you did, how many parts of nitrogen peroxide did you have, as com-

pared to the air?

1021 A. Well, I will have to calculate it for you. I introduced a cubic centimeter at a time, that would be approximately 1.8 milligrams of nitrogen peroxide, and there was an air space there, of something like a liter and a half, which would be nearly two grams of air. So, there would be

about 1.8 in two grams. Well, we may say two milligrams in two grams, so, that would be one in one thousand.

Q. You had one in one thousand? That was your dilution

of the atmosphere to which you subjected it?

A. It was something less than that. I have given you the maximum.

Q. And you kept the flours subjected to that, what length of time?

A. Well, as soon as you put that in there, it begins to be absorbed by the flour, and then the concentration decreases; so, it is impossible to say.

Q. Well, that isn't my question, at all. I am sorry that I cannot make myself understood. My question was, how long

did you have that flour subjected to this?

Q. Why, I will have to give you an estimate. Probably a hundredth part of a second, to that particular concentration.

Q. Did you have this in a closed receptacle?

A. Yes, sir.

Q. How long did you keep it in the receptacle?

A. Until it was all absorbed.

Q. My question was how long you kept it there, not what was the result. Did you keep it there a minute, or an hour?

A. I don't know. I will have to estimate it; probably a minute or two.

Q. One or two minutes? And what was the result on the flour? A. It bleached; it was whitened.

Q. Then, after that was done, did you immediately release it from the receptacle, and take it out?

1022 A. I added another cubic centimeter, and shook it again, Q. And how long did you keep it exposed to that?

A. About the same length of time; about a minute or two.

Q. And how often did you repeat that?

A. Until I added the desired amount of nitrogen peroxide. Q. My question was, how long you kept it exposed to that,

A. Well, that depends upon the amount of flour 1 bleached; there was a minute of shaking, between each addition.

Q. Well, I will have to ask again: How long did you continue that?

A. It depended upon the amount I bleached. This particular flour, for instance, the flour I bleached with 18.6 per million it would have been there about—I had 500 grams. I suppose about 5 times I added NO, and that would have been something like ten minutes—ten or twelve minutes, might have been fifteen; that is only a rough estimate. I can't give the exact figures.

Q. So, you kept adding more of the nitrogen peroxide, from time to time, and kept it there, finally, ten or fifteen minutes. A. Well, that would indicate that I was increasing the concentration. I must explain that, as soon as I added it, it is taken up immediately by the flour, and so, here, we have a concentration, when I added it, the first fraction of a second I had concentration, I will say, one in one-thousand, but, in the next fraction of a second, it is less than that, and it runs down to practically zero, and then I bring it up again.

Q. You kept adding more and more of it?

A. Yes, sir.

Q. And kept the flour in that closed receptacle?

A. Yes, sir.

Q. And kept it there how many minutes?

A. Why, I should say about ten or fifteen minutes. I can't give the exact time. I shook it for a couple of minutes between each addition.

Q. Did the flour continue to change color all the time?
023 A. Well, I didn't examine it between each addition.

Q. Isn't it a fact that the color of the flour disappeared after the addition of the first cubic centimeter?

A. I couldn't tell that, because I didn't examine it, until after I had finished the bleaching.

Q. Then, did you examine it to find the amount of nitrogen peroxide you had added? A. Yes.

Q. And how much had you added?

A. I think that I did. I will have to be sure about that.

Q. Yes. Let us be sure about that.

A. No, I did not analyze that or put that down. I did not make the ordinary test on that flour, for that. The examination that I made of it was indicated here (referring to chart). That is to say, I put it in the vacuum—

Q. (Interrupting) Why is it, that, in none of these examinations, you have never examined flour, to find out what it

contained?

A. That was not essential for this method. It would give me no information, and this method gives the information that you cannot get by such an analysis.

Q. Examining flour to ascertain the amount of nitrogen peroxide which is contained, you think gives us no information?

A. It does not give the information that I got in this experiment.

Q. Well, is that a safe and reliable test to make, as to examine the flour, to see how much it contains?

A. If you suspect that a certain thing is in the flour, and if you detect it and get it out, and get your hands on it, it is a pretty safe experiment.

Q. Well, why didn't you examine any flour to see how much nitrogen it contained?

A. I did examine, perhaps, some flours. That was not important.

Q. The amount of nitrogen in the flour was not im-

portant? 1024

A. The amount of nitrogen peroxide used in bleaching the flour was important.

O. But the same amount that is retained in the flour, you did not deem of any importance, or of enough importance for

you to ascertain how much it retained?

- A. I did not care for that. It has been done many times. There was no point to it for my work, and this is the result I was after.
- Q. The only test which you made to determine the amount of nitrogen in flour was, when you got it in some concentrated form?
- A. I don't know that I just understand what you mean, "in some concentrated form".

Q. Well, you never took any bread and examined it, by itself, but you first got the concentrated form, and then examined that, didn't you?

A. I think I did examine the bread, in one case, yes. The bread I got from the Alsop flour. I examined it, and got about one-third of the amount of nitrogen in it. It had nitrites in it. That particular flour I examined. It is the one that Mr. Winton shipped me.

Q. That is what I tried to inquire about, just as my friend here, got so obstreperous. Now, that was some of the

flour that Winton sent you?

A. It was, ves, sir.

0. When was that sent you?

It was sent me January 10, 1910, I believe. I will say that is the time I received it.

Q. And what did the flour contain? Did you examine it?

A. It contained .75 parts nitrogen, as nitrites. The flour was I S 534-B.

And then you baked some of it? O.

Some of that flour was baked. I did not bake it. Mr. Doan baked it, but I was there and observed it.

How much did it contain, afterward? Q.

.1. .3 parts.

1025 Now, how much is the largest amount of nitrogen which you ever have been able to find in any bread that you have examined.

Mr. Butler: You mean nitrogen, Mr. Smith?

Mr. Smith: That is what I said.

The Witness: I have never examined bread for nitrogen.

Q. That is the largest amount of nitrites that you have ever found in any bread that you have examined?

How examined? By the Griess test?

I don't care how you examined it. Q.

Well, I examined this bread from I S 534-B, and I found there were three parts of nitrogen, as nitrites.

Three parts, as nitrites? A. I should say-Q.

(Interrupting) Was that where you examined the bread, 0. just as you got it, or where you had the concentration?

No, that is where I shook it up with water. You got three parts, there, as nitrites?

0. A. Yes, sir.

Q. For the amount of nitrogen, you would divide that by three and a fraction?

Multiply it. No, I got nitrogen, as nitrites. It is 3.3 times that, as nitrous acid.

Q. But, as nitrogen, it would be what?

A. As I have given you, 3.3.

Mr. Butler: You have said 3, and 3, interchangeably, here during the last two or three minutes. What is it?

A. .3.

By Mr. Smith:

Q. That is less than one-third of one per cent? Is that true?

A. One-third of one per cent is .33, yes, sir.

Now, do you know how those biscuits were made, in which you were unable to find any trace of nitrites?

A. They were soda biscuits.

Q. Just as an ordinary housewife makes soda biscuits? A baker made those biscuits. He made some soda biscuits.

And in those, you could not find any nitrites?

A. I found nitrites in those biscuits.

Oh, I understood you to say you could not find them?

I could not find nitrites in the liquid I condensed from 1. those biscuits.

Q. In the condensed form, you were not able to find any?

A. In the liquid condensed from those biscuits, I was not. Did you examine the biscuits, themselves?

0. We did. Α.

Q. And what did you find there? A. I found nitrites.

To what extent, please? Q.

A. I cannot give you the exact figure. It was appreximately the amount that there was in the flour.

Did you find a greater per cent of it retained in the biscuits, than you did in the bread?

A. Yes, sir. I found a greater per cent retained in those soda biscuits than we did in the bread.

Q. But when you distilled it, and drew off the fluid, or the liquid, as you have testified, you could not find any, at all?

 There were no nitrites in the liquid coming from the soda biscuits.

Q. None could be discovered?

A. Well, I got a trace, something like that one that you see there.

Q. Now, have you made any other investigations of other food products to determine the existence of nitrites in them?

A. I have not.

Q. Do you know whether or not you would find them, by the same tests, if there was nitrites there?

A. If there was nitrogen peroxide there, I would find it, by the same tests, ves, sir.

Q. In your studies as a chemist, have you never made any of those examinations? A. No, sir, I have not.

1027 Q. Substantially, your only examinations have been to determine the amount of nitrigen, or of nitrites you would get from bleached flour, or from the bread baked from it, by the distillation process, rather than from the examination of the flour, itself, or the bread, itself?

A. Largely that, I have examined flours and bread. I might say, in addition, that I have examined a great many drinking waters for nitrites.

Q. What did you find in them?

A. I frequently found nitrites, sometimes.

Q. Now, would the amounts that were present in bread, be dependent, at all, in your judgment, upon the heat that was used in baking, whether it was electricity, or gas, or fuel,—coal or wood?

A. Well, I think it would make very little difference.

Q. Well, what do you mean when you say you think it would make very little difference? Do you think it would make some?

A. We had Mr. Doan make some bread from unbleached flour, at the same time he made this bread from this particular sample, and we examined the bread afterwards for nitrites, and we found a suggestion of a trace. So, I conclude from that that the amount of nitrites, or the amount of nitrogen peroxide taken up in ordinary baking, in an ordinary baker's oven, run by coal, is not measureable.

Q. What is the color of iodine?

A. What is the color of iodine? Iodine, as a solid, as it is at ordinary temperatures, is a dark, crystalline body, almost black. Q. As a liquid, what is it?

A. As a liquid, it is a dark liquid, almost black. It is near-

ly black.

Q. If you pour that on flour, what would be the color of the flour? If you dropped a little iodine on flour, what would be the color? A. I could not tell you, sir.

Q. Don't you know that it will turn it blue?
A. I have never tried the experiment.

1028 Q. Well, as a chemist, can you tell me what would be the result if you pour a little iodine on flour?

A. Not until you tell me what reaction has taken place.

Q. Well, I can't tell you that, sir.

A. Well, I can't tell you the result.

Q. All I know is, if you pour it on flour, it turns it as blue as indigo.

Mr. Butler: In bleached flour, Mr. Smith.

Mr. Smith: Yes, or unbleached.

Mr. Butler: Corn meal?

Mr. Smith: I never tried it on corn meal.

Q. You don't know what would be the result?
A. No, sir, I don't know what would result.

Q. Now, I want to ask you that question again. I want to know your answer, there on that, whether or not there are any other compounds, to your knowledge, besides nitrites, or nitrous acid, that will give a red color, if the Griess reagent is applied?

A. The nitrous acid is the only substance I know, which will give that particular substance,—that azo-dye, with the

Griess reagent.

Q. And you draw the conclusion that this flour contains these, because it gives the red color when the Griess reagent is applied?

A. I do, yes, sir.

Q. If there are other chemicals which would give that, or other compounds which would give that test, then, may not those other compounds be there, rather than what you referred to?

A. Not until it is shown [there] are present.

Q. How is that.

A. Not until it has been shown that they are present.

Q. Well, you have shown that they are present, by this Griess test, haven't you?

A. I have shown that nitrous acid is present.

Q. By this test? A. Yes, sir.

1029 Q. Have you shown that nitrites are present by that test?

A. The Griess reagent is an acid solution, and as soon as you put a nitrite in there, you get a nitrous acid, and it is my opinion that it is the nitrous acid which gives me the reaction.

Q. What would you say about that flour? Is there any nitrogen peroxide in the flour?

A. I say there is nitrogen peroxide there, and nitrous acid.

Q. Any nitrites?

A. Any nitrites? There may be.

Q. Well, I am not after the maybes; I simply want the facts, whether any nitrites are there.

A. Well, I should answer, to that, that there is no direct evidence that there is

(Recess was then taken for five minutes, after which the cross-examination of the witness Hewlett was resumed, as follows:)

By Mr. Smith:

Q. Professor Hewlett, I think you probably explained it, but I don't think I got it straight in my own mind; from what my associates said, I don't think I did. You tested the biscuits, and you did find traces of nitrites—certain amount of nitrites, in them; am I right?

A. You are talking about the soda biscuit?

Q. Yes, sir.

A. I tested the soda biscuit in two ways; I tested it in the ordinary method of shaking up with water, and then examining the liquid that I got.

Q. Yes.

A. Or extract. In that, I found the reaction for nitrous acid.

Q. To what extent, please.

A. I have not the exact data. It was approximately all the amount that was in the flour. It was less,

Q. Well, that don't give me any figures, at all.

 Well, you see a pound of flour does not make a pound of biscuit.

1030 Q. I am getting at the figures, so much per million.

A. I have not any parts per million. I have not got it in parts per million, exactly. I did not pay much attention to that experiment, because I found I did not get the—that I did not get any nitrites in the liquid condensed from it, but, as I remember it, the nitrites, or, that is to say, the nitrogen as nitrites, in the biscuit, was approximately what there was in the flour.

Q. Yes, but how much was that?

A. In the flour, there was .75, and there may have been something like .6 in the biscuit. Those are not the exact figures.

In the biscuits? A. Yes, sir.

Now, the distillation was like which one of these ex-Q. hibits?

The liquid condensed from those biscuits, showed possibly a suggestion, depending upon your eye.

Well is that 28 or 29? This one is 28 and this is 29.

A. In order to compare them that close, you must have them together-not one here, and the other in Princeton.

Q. I thought, in your examination, you said it was like

one of these.

I meant to indicate that it showed a suggestion, as one of those does.

Q. So, in the distillation from the biscuit, when you concentrated it and drew off the liquid, and then examined that, you were only able to get a suspicion of a trace?

A. A suggestion. That might very probably have come

from the reagent.

What do you mean by that?

Well, the Griess test is not entirely without color-the Griess reagent.

Q. If you would just pour the Griess reagent in water by

itself, it would show some color, will it?

Show less than it will before you drop it in, because it is diluted. I think the Griess reagent, there, has a slight color to it. It seems to me so.

Q. And that was about the effect that you secured 1031 when you drew off the liquid from the biscuits, and con-

centrated it, and then made your test?

My conclusion from that experiment was, that there was no nitrogen peroxide coming from those biscuits by condensation.

And these were the ordinary soda biscuits?

A. Those were the ordinary soda biscuits, yes, sir; my baker made them for me, and I simply took his word for it, that they were soda biscuits.

Q. But, do you give it as your judgment, to this jury that, in the ordinary soda biscuit, made in the usual way, there

would not be any nitrites?

# A. From that experiment, yes. Redirect Examination

By Mr. Butler:

Q. You mean by that, that no such nitrites would be pumped out?

A. The result of that experiment, I should say that you would not be able to pump nitrites from a soda biscuit.

Q. Take the same biscuit, and wash it in water, and you would find the nitrites soluble, and get them free?

A. That is what we found, yes.

Q. And the purpose of the two methods is to determine not the quantity, but the character of the chemical reaction that takes place?

A. Whether the nitrogen peroxide is there, as such, or there

as nitrous acid.

Q. Now, in your testimony, you have used the word "atmosphere", sometimes, and the word "air", sometimes. Did you use [then] interchangeably? A. No, I did not.

Q. Well, have you heretofore intended to distinguish between one and the other, as you have given your testimony?

A. That is rather difficult to say, because the question

1032 did not distinguish.

Q. Well, what I am trying to get at, is your testimony, as it is upon the record, are we to read it that "atmosphere" and "air" have been used interchangeably?

A. Well, I think probably so, yes, sir.

Q. You do not recall of any instance where you intended to point out and distinguish one of the words from the other?

- A. In one of the questions Mr. Smith asked me whether there were nitrites in the air. It was necessary for me to understand then what he meant by the "air", before I could answer that.
- Q. Now, I would like to have you distinguish, by taking a piece of chalk and that blackboard, if you can do it better that way, between nitrogen peroxide gas, nitrous acid, nitric acid, and how the two acids are formed from the addition of water to this gas. Write, first, the chemical formula for nitro-

gen peroxide gas.

- A. We have a gas that we call nitrogen peroxide, and it is made up of two chemical parts. One chemical part is nitrogen, and two of oxygen. That is to say, we refer to N, as representing the chemical part. 14 is the atomic weight of nitrogen; and, O, as representing 16 of oxygen. Now, in this we have 14, and in this we find not 16, but 32, so, we simply write NO2, and that is represented that way, representing that substance. As a matter of fact, that represents another ultimate particle, and, as a gas, it is not the only possibility sometimes—there is an equilibrium between them; that is to say, it is part that, and part . . . . , being N2O4. You have both of those present.
- Q. That is what it says in the patent, nitrogen peroxide, NO3, and N2O4, depending on temperature. Now, let me go a little slower. N stands for nitrogen?

A. N stands for nitrogen.

Q. O stands for oxygen? A. Yes.

Q. And the chemical value or weight of N is what?

1033 A. N is 14. Q. Oxygen? A. 16, and, two would be 32. So, the weight, of your molecule as we call it, or ultimate particle, is then 46, and 14/46 of it will give you the percentage of nitrogen, and 32.46 of it will give you the percentage of oxygen. You can work it out in percentages, if you like.

Q. Well, I would like to have you write down on the board, NO2, plus H2O. H2O is water, and shows how it breaks up to form HNO2, to HNO3, and shows from it breaks up to form

HNO2, to HNO3, the nitrous acid, and the nitric acid.

A. Well, there, again, it depends. Exactly what happens, depends upon concentration. It would depend very largely on concentration. I will take, for instance, the result that we might expect without any very dilute or very great concentration. We might then expect to find NO2, dissolving in water, and, combining with it, and splitting up into nitric acid and nitrous acid.

Q. Now, let us take those things one at a time. NO2 is the yellow gas that is formed by the flaming arc of the Alsop

process? A. It is, yes.

Q. H2O is water? A. H2O is water.

Q. And in the flour there is 10 per cent of it, is water?

A. 10 per cent of it is water. Some of it, at least, is on the surface of the grains.

Q. So, when the NO2 comes in contact with the flour, or with anything else containing water, a chemical change takes the place of the NO2 plus water?

A. Of course, we have a large excess of water, and I might put "X" water, and then, over here, "X" water, because we

have these things in solution.

Q. Now, let us suppose that we have some sodium in the flour, the same as you have in soda biscuits. Now, what is the chemical sign for sodium?

1034 A. Na is the symbol for that. This represents 23

parts of sodium.

Q. Now, combining your sodium with NO2, what do you have?

A. We get—you would not combine it directly. It would give you something in the form of a salt. It would give you NaNO2. In other words, the sodium takes the place of the hydrogen.

Q. That is the nitrite? A. Yes, sir.

Q. Now, just assume there is a lot of that in the biscuits. If you put it in this Exhibit 30, and pump it all out, would that give up the NO2, and give us all HNO2, or nitrous acid?

A. It would not, if there was enough base there to com-

bine with the acid.

Q. That is what I mean. Suppose the chemical union is complete—that is, all of the NO2 goes from nitrous acid in

to the salt of sodium, we will say. Could it be recovered by this pumping method, which you have described?

A. No. You would not be able to pump out the nitrogen

peroxide.

Q. So, the failure to recover any from the biscuits, proves that the nitrous acid had combined, chemically?

A. That is the conclusion that I drew from that experiment.

Mr. Scarritt: Nitrogen what?

Mr. Butler: Nitrites of the various bases, such as sodium, or potassium, or the vegetable bases that are in the flour. Am I right?

The Witness: I should say sodium nitrite, sodium nitrate.

By Mr. Butler:

Q. There might be other bases there, perhaps, in the organic part of the flour, to make nitrites, but, when you put the pump onto the flour, before the sodium has been added to make biscuits, you pumped out the NO2 gas in the water, or the HNO2, in solution, in water?

A. That is correct.

1035 Q. So that your two methods show that in the flour the HNO2 is not all combined?

A. That is correct.

Q. It is there as nitrous acid?
A. It is there as nitrous acid.

Q. But, in the biscuit, it is combined, but in the bread,

again, it is not all combined? A. That is correct.

Q. So, the purpose of your investigation by the pump was not to make a quantitative analysis, to find out how much nitrites were in the flour or in the bread, but to find the form that it was there?

A. To find out whether it was there as nitrous acid, or nitrogen peroxide.

Q. As nitrites?

A. Whether it was there chemically combined, or as a solution.

Q. Now, when you take the biscuits, made by the ordinary method, soda biscuits, the pump gives up no liquid which yields the acid, but, by washing that in water, the nitrites dissolve, and you find one nitrites there?

A. Yes, sir, that is correct.

Q. Now, the first question Mr. Smith asked you was, whether you had isolated any NO2 gas, or HNO2, and you said you could not answer that question, as asked, but you wanted to explain it. Now, you can make any explanation you desire.

A. Assuming that the nitrogen peroxide, combining with water, forms nitric and nitrous acids—and that is the conclusion from experiments,—assuming that we get that, we have, in there, nitrous acid. Then, my point is this: Nitrous acid is a liquid. It is a solution of the compound, represented by the formula HNO2, in water, and, according to my knowledge, it does not exist as anything else than a liquid. It does not exist as a solid, or as a gas, or as a vapor. You cannot have it, when you take all your water away. In other words, you would simply have a solution, but you may have it of varying concentrations.

1036 Q. In other words, HNO2 does not exist, except in

combination?

A. That is the conclusion, from the evidence we have upon that subject.

Q. The NO2 does?

A. The NO2 certainly exists as such.

Q. And the nitric acid-

A. (interrupting) The NO2 certainly exists as such, without any other substance present.

Q. And the nitric acid, of course, is a very common article

of commerce? A. Yes.

Q. Now, with reference to the degree, since you apply the Griess test to the extract of the bread,—that is entirely different from washing the bread with water, and filtering the solution, and testing it?

A. Yes, sir.

- Q. Now, since you added the Griess test to Exhibit 30, you find there is a practical correspondence between that and the fluid in Exhibit 21, do you not?
- A. As far as my eyes go, from this distance, I see no difference there; one is a little smaller than the other, and, of course, the color of a liquid depends upon the depth through which you look.

Q. Now, what I am trying to get at, is this: You say it

is not all exhausted from the bread yet?

A. I should say not.

Q. Now, I want to get at the degree of strength of the solution which comes out as a vapor, and, because the surface of this glass tube is cold, it condenses, as frost, like moisture on a window pane? A. Yes.

Q. I want to find out whether or not the solution that first comes, is the same thing as that which comes a little later,

and a little later?

A. In one of the experiments, at Princeton, we had an accident after it had gone along a while, a certain amount of the liquid was removed, about one-third of the total

amount removed. That was preserved by itself, and, later, another accident occurred. So, we got a second

sample of the liquid from this same flour, and then we got, finally, a third. Well, the first showed the less nitrous acid. The less concentration of nitrous acid. That is to say, it seemed, from that experiment, that experiment showed that the nearer we approach complete removal of the liquid, the greater the HNO2 concentrated. In other words, it would have more nitrous acid than the first portions removed, and that is in accordance with what we might expect, from other things that are known, from a scientific standpoint, about surface absorption, and the film of moisture, and so on.

Q. Now, from the examination that you made of this flour, bleached, which was furnished you from one of these exhibits by Mr. Winton, by this pumping method, you say that there is still in that flour which was bleached, some 60 or 70 days ago, NO2, or HNO2, as such, which has not yet fastened itself in chemical combination upon the ingredients of that

flour?

A. That is the conclusion, from that experiment, yes, sir.

Q. You spoke of a trace of nitrite, and a suggestion of a trace of nitrite reaction material. I would like to have the

meaning of that expression stated upon the record.

A. Well, whenever you have these two compounds in solution, in an acid solution, particularly acetic acid solution, the reagent,—these two organic compounds, and you bring into it nitrous acid, or anything that will make nitrous acid, you would form this azo-dye and give the intense coloring power. Now, it is possible to detect one part of nitrogen, as nitrites, in one-thousand million parts, and our reagent, it is pretty hard to keep them free from that, absolutely,—nothing absolute, in science, as a matter of fact,—and the glassware, and one thing and another, of that kind, so, it is very possible for you to get something that will mean one part in one thousand million. If that disturbs you, it is un-

fortunate.

O. Well, what is a trace?

1038 Q. Well, what is a trace?

A. A trace means something like that, which could possibly come from the reagent, or the process.

Mr. Scarritt: And not from the material, itself?

The Witness: And not come from the material itself.

By Mr. Butler:

Q. Now, for example, you said, a while ago, in the cross-examination of Mr. Smith, that this Griess test, which is marked Government's Exhibit 3, here, seemed to you to be a little off.

A. It seemed to me.

Q. Would you say that that is an illustration of what is meant by a trace?

A. Yes. Now, there may be a question about that, that there is a red color on that. Now, there is a red color on the label, there, and if you had that in your line of sight, you might observe a little pink, in that solution. Turning it, again, this way, it may again be questionable. That is a matter, perhaps, of judgment on one's part.

Q. Such a reagent is apt to contaminate about the laboratories, where there would be fumes of nitrous acid in and out, as, for example, if this was still giving off some fumes?

A. Yes, very readily.

Q. And, if the Griess test was exposed to that, it might be contaminated some more?

A. Yes, sir, that is correct.

Mr. Butler: That is all.

Mr. Smith: That is all.

The Court: Just a moment. Now, one of the jurors made a suggestion to me that this Griess test be applied to the flour, bleached and unbleached. Now, if there is no objection, that may be done, but, further than that, I don't think it desirable or advisable to have these experiments made here in the court

room, for the reason most obvious to lawyers, with 39 which jurors are very likely to be led astray, namely,

it is impossible to put it into a record for the purposes of review, by other proceedings, later on, if such proceedings should be desired. Not only that, but, I want to say, once and for all, in reference to this, if one side suggests to the other side that these experiments be made, that coerces the other side to agree that it shall be done; otherwise, the jurors get the false impression about the situation. So, I do not think that it is desirable. I am not criticizing anybody. That has not been done, but I am afraid it will lead on to that. One side proposes a test be made, and the other side will be compelled, as a matter of course, to agree that it shall be done, or else be put in the light, before the jury, of being afraid of it. So, that won't do. So, let us not have any co-contracts, or horse-trades, or anything else of that kind, in this case, here. Now, if you have got some bleached and unbleached flour-

Mr. Butler: I have sent for some bleached and unbleached flour, and as soon as I get it, I will have Professor Hewlett make the demonstration.

George Freeman, being recalled, was examined, and testified further as follows:

### Direct Examination

By Mr. Smith:

Q. I just wanted to ask you, Mr. Freeman, to give me the day and time when you were working at Morton's. A. It will be simply from memory.

Yes. A. About four and a half years ago. 0.

The Court: Make it as definite as you can.

The Witness: Between four and four and a half years ago.

The Court: Well, state when that was. Subtract that from 1910.

The Witness: It was the latter part of 1906, or the first part of 1907.

By Mr. Smith:

Q. You worked there about six months?

A. About six months.

Mr. Smith: That is all I wanted to get.

Witness Excused.

Hannah L. Wessling, called as a witness on behalf of the Government, being first duly sworn, testified as follows:

## Direct Examination

By Mr. Butler:

Q. Your name is Hannah L. Wessling? A. Yes.

Where do you live, Miss Wessling? A. Chicago. Q. You are employed by the Government in its food labora-Q.

tory at Chicago?

A. Yes, sir, in the Food Inspection Laboratory, at 1041 Chicago.

What education have you had, if any, generally, and

technically?

- A. Well, I studied chemistry at the University of Cincinnati, taking the degree of Bachelor of Science, and a year later, the degree of Bachelor of Science in chemistry. Following my graduation, I taught chemistry in the Woman's Medical College at Cincinnati, until that college was absorbed by one of the medical schools for men. Following that, I was the teacher of chemistry in the High School at Newport, Kentucky, and, from there, I went up to Chicago to accept my present position with the Government, the Food Laboratory there.
- You have been here in Kansas City since about the date of the commencement of this lawsuit?
  - A. Yes, sir, since the morning of the 31st of May.

- (At this point the witness was temporarily excused, and the test mentioned by the Court was then conducted by the witness Hewlett.)
- G. A. Hulett, being recalled, was examined by Mr. Butler, and testified as follows:

By Mr. Butler:

Q. I show you the beakers, marked 8 and 12, respectively, in each of which there is some flour, and upon each of which you dropped four drops of the Griess test, and ask you whether the reaction for the nitrite reacting material is indicated in the beaker marked 8?

A. In the beaker marked 8, I got a very strong reaction for

nitrites, very marked.

Q. And how, in the beaker marked 12?

A. Some eyes might claim that there was a suggestion 1042 of pink there. It might quite well be from the effect of a liquid on a finely divided substance. If you would put a little moisture on a piece of cloth, it will look dark.

Mr. Scarritt: We object to arguing it.

Mr. Smith: It speaks for itself.

The Witness: I get nothing there that will suggest anything except the merest possible trace of nitrogen peroxide.

## Cross-Examination

By Mr. Smith:

Q. Doctor, is it the flour that changes color, or the liquid that you put on there?

A. That color is due to an azo-dye.

Q. Now, that isn't my question, at all. Is it the flour that changes color, or is it the liquid?

A. The color is due to a distinct combination.

Mr. Smith: Now, I move to strike it out, your Honor, my question is plain.

Q. Is it the liquid that changes color, or is it the flour?

A. Well, I should say, perhaps, it was either of them. It

is this thing that is formed in the presence of an azo-dye.

Q. Oh, well, my question was, which one changes color there, the liquid or the flour. I am not talking about azo-dyes, and I think you ought to answer that question. Does the liquid, the Griess reagent that you put on the flour—is that what turned the color, or is it the flour which turns color?

A. The two coming together, form this substance that gives

the pink effect.

Q. Has any of the flour that was in there changed color?

A. Has any of the flour changed color? What do you mean by the flour changing color?

1043 Q. I can't make myself understood any plainer.

By Mr. Butler:

Q. What is the chemical reaction that takes place, that

gives the pink color, in the beaker, marked 8?

A. We have two chemical substances, which we have in the solution known as the Griess reagent. When we bring in contact with that solution anything that contains nitrous acid, or will form nitrous acid, we get definite compound there that gives us this color.

### Witness Excused:

Hannah L. Wessling, recalled, was examined further, and testified as follows:

## Direct Examination, (Continued)

By Mr. Butler:

Q. Have you had some experience in bread making, experimental, and otherwise? A. I have.

Q. During what period of time?

A. I had experience at home, before I went to Chicago, in the domestic line, and, since I have been in Chicago, the greater part of my time has been spent on the work with flour, which brought up, of course, baking, as well.

Q. In both the bleached and unbleached flour?

A. On both bleached and unbleached, yes, sir.

A. On both bleached and unbleached, yes, sir.
Q. Both the flours bleached in the ordinary course of bleaching, at mills, and the flour that was bleached in the laboratory, for experimental purposes?

A. Yes, sir, wheat flours, bleached at the laboratory,

1044 and wheat flours bleached at the mills.

Q. Since you came here, have you made any baking of bread, from any of the flour that was seized in this case?

A. I have.

Q. Where did you get that flour?

A. There was one bag, the remnants of the bag had been sent to the Chicago laboratory, was sent down here, and I made one baking, from a portion of that.

Q. That is, the bag brought here by Professor Winton?

A. Yes, sir.

Q. And the one that has been brought to the court room, and introduced in evidence? A. Yes.

Q. That is, Exhibit 8. Did you bake some of the bread from that? A. I did.

Q. Is that the same bread referred to by Dr. Hewlett, in his testimony?

A. Yes, sir, it was part of that bread, that Dr. Hewlett examined for the nitrites.

Q. In this pump? A. Yes, sir.

Q. Now, you may tell the court and jury how you made that bread.

A. That particular bread that was used by Dr. Hewlett, was made according to the Koellner method, or the straight dough process. The amount of flour was 340 grams, or about 12 ounces, and the yeast—shall I give the quantities?

Q. Yes.

A. There were 10 grams of yeast used to that amount of flour, 12 grams sugar, and five grams of salt. The amount of water we determined beforehand, by the absorption test, and the ingredients were first mixed—that is, the ingredients were first mixed for a definite length of time, ten minutes later, the one-third of the flour which had been reserved and made warm,

was added, and the mixture was kneaded for ten 1045 minutes. It was then molded, and placed in the tin,

and set in the rising closet, and raised to a definite loaf determined by a little gauge—tin guage, that is placed over the pan, and at the time it reached the gauge, it was placed in the oven, and baked until it lost exactly thirty grams of weight. I used the flour that was seized. That was all you care to know about this?

Q. Yes. That was some of this very same bread that was used by Dr. Hewlitt?

A. Yes, sir, it was a part of that loaf, that he used.

Q. That he extracted the nitrous acid from?

A. Yes, sir.

Q. Did you make any other bakings from any of the flour that was seized, since you came here?

A. Yes, sir, there was a bag of the flour brought down, I think from Castle, Missouri, later, and I have made baking tests on that.

Q. That was one of two bags brought down by Mr. Wins-

low? A. By Mr. Winslow, yes, sir.

Q. And the flour that was obtained from that quantity, was that the flour from the bag that is here in the court room, and which is marked Exhibit 13, or, was it from the other bag which is not here in the court room, or do you know?

A. It was made from Exhibit 13.

Q. No. 13?

A. From that particular bag.

Q. Now, did you make any baking from this "Purity" flour, unbleached flour, which Mr. Winslow brought here from Castle, and which Mr. Leflang says is the same kind of flour that the seized flour was, except that the seized was bleached, and this is not bleached?

A. Yes, sir, I also baked that.

Q. Have you preserved specimens of these two breads?

A. Yes, I have some specimens.

Q. And did you make any bread from any unbleached flour that has not been exhibited here in the court room?

- A. Yes. We took some flour that was brought from the Kelly mill, a mill that I understand doesn't bleach flour. I also baked bread from that.
  - Q. And any from the "Aristos"?A. I baked from the "Aristos" flour.
  - Q. What is the name of the Kelly flour?

A. I don't know.

Q. Well, we will call it "Kelly", then.

- A. I think they call it "Kelly's Best", but I don't know of any particular brand.
- Q. Now, were these breads from the four different flours made in the same way, so as to furnish a basis of comparison?

A. Identically the same.

Q. That is, bread from Exhibit 8, bread from Exhibit 12, bread from "Kelly's Best", and bread from "Aristos"?

A. Yes, sir.

Q. Now, have you those in court?A. I haven't all of those, there.

Q. Which ones have you?

A. I have three. I have the one from the seizure, one from the "Purity", and one from the "Kelly".

(Handing bottles to the witness.)

Q. Pick out of those little bottles the bottle containing the bread made from Exhibit 8, if you can.

A. No, I haven't any of Exhibit 8 here.

Q. Then have you any of the bread of the seized flour?

A. Exhibit 13, yes, sir. Q. Exhibit 13? A. Yes.

Q. And Exhibit 8? Now, let us have the one from Exhibit 13. That bleached, seized flour?

A. There are two, one made by this Koellner method that I have just described, and another according to the domestic method of making bread in the household.

Mr. Butler: We will have them marked as exhibits.

- 1047 (Samples referred to marked by the reporter as Government's Exhibits 30 and 31.)
- Q. Exhibits 30 and 31 are both made from flour in Exhibit13? A. Yes, sir.

Q. And one is made by the Koellner method, and the other is made by the domestic method? A. Yes, sir.

Q. Which is made by the Koellner method?

A. Exhibit 31 is make by the Koellner method.

We will put a "K" on that one, then, to stand for Koell-Q.

ner. A. 30, that is made by the domestic method.

Q. And we will put a "D" on that, to stand for domestic. Now, I observe that there is a strip of pink color-reddish, pink color, in the center of each one of those pieces of bread. How did that come there?

A. I put some of the Griess reagent on the bread, and it

brought out that color.

Mr. Butler: Exhibits 30 and 31 are offered in evidence.

Q. Now, have you some bread made from an unbleached flour?

A. I have some made from that "Purity" flour, that was to

replace it. Q. By the Koellner method, and by the domestic method?

And the domestic also, from Exhibit 12.

These are both from the same bag-"Purity"? Q.

Same bag. A.

Mr. Butler: We will have these marked.

(Exhibits referred to are marked by the reporter Government's Exhibits Nos. 32 and 33.)

Q. Which is the Koellner, and which is the domestic method? A. The Koellner is No. 33.

Q. And 32 is the domestic method? A. Yes, sir.

Mr. Butler: I will mark them similarly, "K", and "D", so we will not have to refer back.

1048 Q. Did you apply the Griess test to the bread, Exhibit 32 and Exhibit 33? A. Exactly the same.

The same way, and to the same extent?

The same way, and to the same extent, exactly. Did you get any nitrite reacting material test? Q.

None at all.

Mr. Butler: The exhibits are offered in evidence.

Q. Now, the baking was the same, in each instance—that is, the domestic method was applied to one sample that you have indicated, of the bleached flour, and to one of the unbleached flour, here in evidence? A. Yes, sir.

Q. And the Koellner method, to one of each? A. Yes.

And the Griess test was applied, after baking, in each instance? A. After baking.

- Q. And applied by the same method? A. The very same.
- Q. Now, have you made any bakings from bleached flour and unbleached flour, for the purpose of comparison, mixing into the dough of each, some of the Griess test, to see how the test would affect the two kinds of flour, bleached and unbleached, and to compare the product?

A. Yes, sir, I have done that.

Q. Now, what flour did you take for the bleached flour, for that?

A. I took some of this same seizure, Exhibit 13,

Q. Now, when did you apply the Griess test, to the bread in Exhibits 30 and 31,—before baking or after baking?

A. After baking.

Q. And when did you apply the tests in Exhibits 32 and 33?

A. After baking, at the same time.

Q. At the same time? A. Yes, sir.

1049 Q. And in the same quantities, and so forth?

A. Yes, sir.

Q. Now, you say you have made some bakings, by applying the test to the flour before baking?

1. Yes, sir. It was not bread however, raised with yeast.

Q. It was what? A. It was biscuits.

Q. You made biscuits? A. Yes, sir.Q. Made them both in the same way?

A. Made both exactly in the same way.

Q. Now, you got the bleached flour from Exhibit 13?

A. Yes, sir.

Q. And the unbleached?

- A. The unbleached was "Aristos". It is not here in court, I believe—an unbleached flour.
- Q. Did you test it, before you baked it? Did you test it with the Griess test, for nitrites?

A. Yes, sir.

Q. And the "Aristos" did not disclose nitrites?

A. It did not show any.

Q. Now, describe to the jury how you made these Griess

biscuits, we will call them.

A. I made them as well as I know how to make baking powder biscuits, instead of using water or milk, as would be used in the case of baking powder biscuits, I used the Griess reagent, using that as the liquid with which to mix them up, after the salt, baking powder, and the shortening had been added to the flour. In one case, I used the reagent of the regular strength, and, in another case, just for comparison, I diluted that reagent so that I had one part reagent with four of water,—one to five.

Q. Well, I know, but what I wanted to get at is, was the bleached flour treated the same way as the unbleached flour?

A. It took a portion of the bleached flour, and a similar portion, exactly the same weight, in each case, of flour.

Q. (Handing the witness a biscuit) That is the un-

1050 diluted? A. Yes.

Q. (Handing the witness another biscuit) And this is the other?

A. Yes, but this is the same flour. Now, this is the bleached

flour. I have some unbleached, made in the same way.

Q. But I want to get the bleached flour you treated with the undiluted Griess, compared with the unbleached, that you treated with the undiluted Griess. Is that it?

A. No, this is the diluted one.

Q. Well, come down and pick them out.

(Witness does as requested.)

Mr. Butler: Now, we will have them marked.

(The exhibits referred to are now marked by the reporter Government's Exhibits Nos. 34 and 35.)

(Exhibits 34 and 35 are shown to the witness.)

Q. Now, you may tell us out of what flour Exhibit 34 was made, and how you made it, in detail?

A. Exhibit 34 was made with the seizure flour.

Q. Exhibit 13?

A. Exhibit 13. To 125 grams of flour, I added three grams of salt, four grams of baking powder, and 20 grams of lard, and used 72 c. c. of the straight reagent, Griess reagent, to mix them up, and I divided that amount of dough into three biscuits, or three portions—I beg your pardon, now, I did not make three biscuits of all of that. I took one third of that mixture, after I had mixed the baking powder, salt and lard with the flour, I took exactly one-third of that mixture, and doughed that up.

Mr. Scarritt: What do you mean by the mixture—the raw dough?

A. Yes. It was not a dough, yet. It was almost a dry mixture, of simply the flour, with the salt and baking powder, and the lard worked into it. It was from this that I took exactly one-third of the weight, and that I mixed with 23 c. c. of the Griess reagent.

Mr. Scarritt: You mean 23, instead of 72?

1051 A. Yes, sir. Just enough to make it of the proper consistency to make into a biscuit.

Mr. Scarritt: You put 23 into that one biscuit?

A. Yes, sir. Just enough to dough it up.

By Mr. Butler:

Q. Well, now, go on.

A. Then I baked it, and the result can be shown right there (breaking the biscuit open), showing that the color, which of course came out as soon as the reagent was mixed with the flour—the effect was not destroyed by the baking. If anything, it was intensified.

Q. Now, how did you make Exhibit 35? Was that made at

the same time as 34?

A. Made immediately before this. I did not make them at the same time, because I baked each by itself.

Q. 34 was made the same day as 35, and immediately be-

fore? A. Yes, sir.

Q. Now, how did you make 35?

A. I used 125 grams of flour, of the "Aristos".

Mr. Smith: I object to this, because it is a comparison between different flours. One is a Lexington flour, and the other is a Kansas City flour. That is not a fair comparison to make.

By Mr. Butler:

Q. You tested this "Aristos" for nitrite reacting material, and did not get it? A. Yes, sir.

Q. It was not bleached? A. No, sir.

Mr. Butler: We simply wanted to bring out the difference between—

Mr. Smith: All right, then, you should have used Lexington bleached, and Lexington unbleached. That is not fair.

1052 Mr. Butler: We will do that, if you want us to.

Mr. Smith: Well, I don't care whether you do or not, but I think that that is not fair, and I object to it as being incompetent, irrelevant and immaterial.

The Court: Objection overruled.

Mr. Butler: (Producing a bag of flour) Now, let us have this bag marked.

(The bag of flour was then marked by the reporter Government's Exhibit No. 36.)

The Court: You say this flour you tested, before you baked it into bread?

A. Yes, sir, and it gave no reaction for nitrites.

Q. (Showing witness Government's Exhibit No. 36) Was it some of this sack of flour, marked Exhibit 36, that you used to bake the biscuits, Exhibit 35? A. Yes, sir.

Q. That is branded "Aristos, the best, Kansas City, U. S. A., registered, U. S. Patent Office.", I guess. I am not sure I have read that right. That is the brand?

A. Some of that flour was used to make this biscuit.

Q. Now, how did you make Exhibit 35, as compared with 34?

A. Exactly the same way, using exactly the same ingredients.

Q. The same quantities of each? A. Each.Q. Show the jury the interior of that biscuit.

(Witness does as requested.)

Q. Are Exhibits 34 and 35 identically the same in all respects except in the flour used?

A. Exactly the same, with the exception of the flour.

Q. Neither of these biscuits was intended, of course, for use, or edible purposes? A. Oh, no.

Q. Merely made for the purpose of effecting a comparison between the bleached and unbleached flour, being treated alike, using this reagent.

1053 The Court: This Griess test?

The Witness: It is simply to see the effect the baking might have on it, whether it would affect the color or not.

Q. Is there an odor to this Griess test?

A. A most decided and unpleasant odor.

Q. It has a kind of acetic acid odor, hasn't it?

Q. Was the odor derived from those biscuits similar to the odor from the Griess test? A. Yes, sir.

Q. Now, did you make any other bakings of biscuits, for the purpose of comparing the effect of the Griess test, for dilute?

A. Yes, sir. Diluted the reagent.

Q. And what flours were used? A. The same flours.

Q. Exhibit 13, the bleached flour which has been seized, and Exhibit 36, "Aristos", which you tested for nitrites, and did not find them? A. Yes, sir.

Q. Now, can you pick out a pair of those, for comparison?

(Witness does as requested.)

A. This is the biscuit that was made of the bleached flour, Exhibit 13, with the diluted reagent. It still shows a decided pink color.

(Breaking open the biscuit.)

Q. All right. You have gone a little fast for me. I intended to mark these as exhibits in the case.

(The exhibits referred to were then marked by the reporter Government's Exhibits Nos. 37 and 38.)

Q. Now, Exhibit 37 was made from what flour?

A. Exhibit 13.

Q. Some of the seized flour that was bleached, and Exhibit 38 was made from what? A. From Exhibit 36.

1054 Q. Were those two biscuits made alike?

A. Made exactly alike, with the exception of the flour.

Q. With the exception of the flour? Did you use the Griess

test in the dough of the flour of each, before baking?

A. I mixed some of the Griess reagent with some water. I used one part of the reagent to four parts of water, and used just enough to dough up what I had, using the same amount of liquid in each instance.

Q. And were those biscuits made the same as were the biscuits, 34 and 35, except that in 34 and 35 you used the Griess test without dilution, and in 37 and 38, you used it diluted, four parts of water to one of Griess, or, three parts of water to one?

A. Four parts to one of the Griess reagent.

Q. Four parts of water to one of the Griess reagent, making it one-fifth strength? A. Yes, sir.

Mr. Butler: Exhibits 37 and 38 are offered in evidence,

Mr. Smith: No objection.

By Mr. Butler.

Q. (Showing witness Government's Exhibits Nos. 39 and 40) I show you two biscuits, marked Exhibit 39 and Exhibit 40, respectively. From what flour were those biscuits made?

A. From Exhibit 13.

The Court: Both of them?

A. Both made from the same flour.

By Mr. Butler:

Q. And what was the date of baking Exhibit 39?

A. Exhibit 39 was baked on the 11th of June, and Exhibit 40 was baked on the 10th of June.

Q. Was any of the Griess reagent used in either?

A. None at all. Simply water.

Mr. Scarritt: Simply water, you say?

1055 A. Yes, sir.

By Mr. Butler:

Q. Were they made in the same way as were Exhibits 34 and 35 and Exhibits 37 and 38, except that no Griess reagent was used? A. Yes, sir.

Q. So, these biscuits are made in the ordinary method, suitable for food?

A. Yes. It would be a biscuit such as might be made from any flour on the market.

Q. These biscuits appear to be different in appearance.

Was the same method employed in both?

A. I think there was a little more water in the one.

Q. In which one?

A. In this one, No. 39. 39 had a little bit more water than 40.

Q. How does it happen that the external appearance of

No. 40 seems smooth, and 39 seems relatively rough?

A. I moulded that in my hands, to make it smooth, and this one, I made a little more soft, a little more like the drop biscuits, and of course, it was left to assume whatever form it would in the pan.

Mr. Butler: They are offered in evidence.

Q. (Showing the witness Government's Exhibits Nos. 41 and 42) I call your attention to Exhibits 41 and 42, being what purports to be a half biscuit, and ask you if you baked them?

A. Yes, sir.

Q. On what date? A. On the 11th of June.Q. Were they of the same set as was Exhibit 39?

A. The same as 39, yes, sir.

Q. And made the same way? A. Yes, sir.

Q. Both of them?

A. Yes, sir. These are parts of one biscuit.

Q. And made from the same flour, and made from the same dough?

1056 A. Made from the same dough, exactly.

Q. That was Exhibit 13, the flour which has been seized here? A. Yes, sir.

Q. I notice the nitrite reaction test color, on Exhibit 42?
A. I dropped some of the Griess reagent on this biscuit, after the baking, and this one has been untreated, simply show-

ing the difference.

Q. That is, to 42 you applied the test?

A. I applied the Griess test, after baking, but 41 I did not.

The Court: Each half of the same biscuit?

A. Yes.

By Mr. Butler:

Q. So that Exhibit 41 and 42 taken together, make one biscuit? A. Yes, sir.

Q. I thought it was part of two biscuits.

A. No, sir, part of the same biscuit.

Q. One has the Griess test put on it, and the other has not. That is the only difference?

A. That is the only difference, yes.

Mr. Butler: These are offered in evidence.

(Thereupon the Court adjourned to ten o'clock a. m. Tuesday, May 14th, 1910.)

1057

Morning Session.

Kansas City, Missouri, Tuesday, June 14, 1910.

Court met pursuant to adjournment and the further hearing of this cause was resumed as follows, to-wit:

Hannah L. Wessling, in continuation of her direct examination further testified as follows:

By Mr. Butler:

Q. When you made these biscuits which have been offered in evidence do you know whether or not the mixture was acid or alkaline in its character after you had added the Griess reagents? A. It was acid.

Q. Did you determine the amount of ash contained in any

of the flour that was seized? A. I did.

Q. What was it? A. .57 per cent. Q. Of one per cent? A. Yes, sir.

Q. How does that quantity compare with the ash contained of patent flours that you have become familiar [—] in your work?

A. It is considerably above a patent flour.

.Q Did you examine the ash content of many patent flours?

A. I have very many.

Q. And the character of the gluten, have you observed that in this seized flour?

A. Yes, sir, I washed out the gluten and that amount was above that, that I have been accustomed to find in the regular patent flour, and the character was such as to indicate a flour of inferior grade.

Q. In what respect would the character indicate that?

1058 A. It was tough and less elastic than gluten from the patent flour; besides it had the grayish color of a bleached flour, not being yellow as unbleached flour is.

Q. Now as [the] the baking qualities of the seized flour did you observe that with respect to the loaf volume and the color

and flavor?

A. Yes, sir; I baked up the flour from this seizure sample and had at the same time the brand that we thought was a standard patent Aristos to compare with it, and the loaf volume in every case was smaller than that of the patent flour.

Q. One time 89½ per cent of the other, of the loaf volume made from the aristos?

A. Yes, various figures, but in every case was considerably smaller than that of the patent I used at the same time; then in addition the color was different, being of a dull grayish color and dead or lifeless, not having the brightness or the silkiness that the unbleached always shows.

Q. Now as to the flavor?

A. The flavor was—the flavor of the seizure I might designate as being flat; while that of the patent, the unbleached patent that we were using at the time was very—well, sweet and palatable, nutty you might say.

Q. And as to the presence of nitrites in the bread made from

the seized flour?

A. Well, that we have been stating over and over again, the

presence of the nitrites with the Griess re-agent.

Q. Now speaking of bleached flours generally I want the benefit of your observation and experience as to the effect upon the gluten of bleaching upon the quality and quantity of the gluten?

A. The gluten seems always affected and the quality especially is noticeable, but we have also noticed that the quantity recoverable is less in the bleached flour than from the grinding unbleached flour; the quality, though, is especially noticeable, being less strong and less elastic than the gluten from the corresponding unbleached flour; it seemed always to have

that effect on it.

1059 Q. Now as to the effect upon flavor?

A. The flavor is always injured; there is either simply a flat flavor, or if not that; it has a strong flavor, leaving an unpleasant after-taste.

Q. And as to the color of bread?

A. The color of the bread made from the bleached flour is very often lighter, I might say usually lighter, but nearly always, or might say almost invariably it has that dull dead appearance, quite dead, from the unbleached flour.

Q. Now, generally speaking, what has been your observation of bleached flours generally, whether or not they produce

bread which will give a nitrite re-acting material test?

A. Beg pardon, I don't believe I quite got the question.

Q. Do you find nitrite re-acting material in breads made

from bleached flour, generally?

- A. Why, there is enough nitrite re-acting material in the flour to give a decided re-action, you always get it in the bread, I have never known any case where there was sufficient to give a decided re-action in the flour where you did not find some in the bread.
- Q. Now, do you know whether it is possible to so manipulate the dough, either by use of yeast or otherwise, as to-I

mean, large quantities of yeast, so as to lessen or eliminate the nitrite re-acting material from the bread?

A. I don't know it from my own experience, but I think that

it is.

Judge Scarritt: That is enough.

By Mr. Butler:

Q. Well, have you had any observation that would justify an opinion upon that point? A. I have I think, because the

Judge Scarritt: What he thinks he has, if Your Honor please, don't-

Mr. Butler: No, we go by what she has observed.

The Court: She may answer.

A. I might say that I failed to notice that word "lessen".

Kinds that I have used have shown a lessening, so I 1060 think I am prepared to answer that. The longer the yeast acts on bread, as my experience has been, that raises bread, the longer the yeast acts on it the less is the amount of the nitrite re-acting material left in it, so I think it is possible to so manipulate it that excessive amounts of yeast and long rising, that you might get rid of possibly all, but it is not the usual method or could not be considered a method of general use.

Q. Now, with respect to the methods employed by you in making the bread from bleached flour and other flour for the purpose of comparison and which left this nitrite re-acting material in the bread, how do those methods compare with methods of bread making ordinarily followed for the manu-

facture of baking of bread for consumption, use?

A. The method that we use and called the domestic method was based, as nearly as possible, on the method used in the household. We give it even the extreme of raising so as to be as fair as we could. The method known as the Koellner method gives a bread that is very comparable with ordinary home-made bread in texture and flavor, and so forth.

Q. Have you been able to observe which of the two methods, if there is any difference in results, leaves the bread yielding—other things being equal—leaves the bread yielding the stronger re-action, that is, the Koelner method or the domestic

method?

A. The Koelner method leaves a larger amount of the nitrite—re-acting material in the bread because it is raised, in much shorter time than the other.

Q. Now, in making your determinations or examinations as to flavor the effect upon the flavor by bleaching, how has

that been by immediate comparison, tasting one, and then in a short time tasting the other, or about the same time?

A. Yes, sir, we take the two samples, but we were either blind-folded or had our eyes closed, in some way not able to see the bread, so that we were not prejudiced by the color,

but tasting one, and after a few moments, tasting the 1061 other. Comparing the flavors in that way of these two samples which we did not know apart, we determined which was the better, in our opinion. Then where we were able to look at them after we made up our mind and found out which was which.

#### Cross-Examination

By Mr. Smith:

- Q. How long have you been in the employ of the Government Pure Food System?
  - A. A little more than two years and a half.
  - Q. What is the character of your work there?
  - A. Analytical chemistry.
- Q. Describe to us a little more fully what that is, will you?
- A. Well, if I am employed on the regular work I have different food materials given me to analyze to determine the constituents that we desire to know. We analyze these substances just as they would, I suppose, in any chemical laboratory.
- Q. I see. How much of your time in the Government's service is devoted to cooking, baking, and so forth?
- A. I couldn't say exactly how much or what proportion, but quite a good deal of this flour work has necessitated my baking bread from the flour in order to make our determination on the bread as well as on the flour itself.
- Q. How much of your time during the last two years have you devoted to bleached flour?
  - A. I should say the greater part of the time.
- Q. What has been the character of your work on bleached flours?
- A. Both analysis of the flour itself and the determination of the gluten and the baking of the bread, and the analysis later of the bread.
- Q. The flours that you have examined have been both bleached and unbleached? A. Yes, sir.
- Q. Now, in the examination of flours do you go to the mill and get the two, the bleached and the unbleached, or do you ask for it in your laboratory?
- A. We do both; the inspectors we send out to get flours from the mills, and they get both the bleached and the unbleached from the mills, and we also have unbleached flour sent to the laboratory which was bleached there.

Q. Bleached there, what has been the majority of your work, on bleached flour at the mill or bleached at the laboratory?

A. Well, I guess it was pretty evenly divided.

Q. What system have you used in bleaching flours at the laboratory, the method of generating nitrogen peroxide, how is it generated?

A. From [ferrors] chloride, potassium nitrate and hydro-

chloride acid, chemical re-action.

Q. In your laboratory did you ever use an electric apparatus to generate your nitrogen peroxide?

. We have not had that apparatus to do it with.

Q. You know, as a matter of fact, do you not, that most mills over the country, Missouri and Iowa and Kansas and Nebraska, and all over where the bleaching is so nearly universal, use electric apparatus?

A. I think a good many do, but from the reports we have from the inspectors we found that there were chemical bleach-

ers, nitric acid bleachers, and so forth used.

Q. Your investigation along that line has been aiding the department in its contest with the millers on the question of whether they had a right to bleach flour; that has been the purpose of your investigation?

A. Well, they asked us to find out mainly the differences

between bleached and unbleached flour.

Q. That has been done in connection with Mr. Bigelow or the department that he is connected with?

A. Well, the authorities at Washington, of course,

1063 would give orders.

Q. Well, your purpose was, you knew your purpose was to aid the Government in these different contests that had been started over the country?

A. I was simply given the work to do; I tried to do what

I was asked to.

Q. Did you have other flours from Nebraska that you investigated?

A. Yes, sir, we had flours from there.

Q. A good many from a good many different mills?

A. As far as I remember we had flours from all over the country.

Q. Do you remember whether or not you had the flours from I will say, from the Updike Mill in Omaha?

A. Yes, sir, we had a flour from there.

Q. Did you have samples of their bleached and unbleached?

A. Yes, sir.

Q. Did you have any samples of theirs that was seized?

A. I don't remember now, I don't remember whether we had a seizure sample from there or not; I suppose I could

look it up on our sheets but I have not figures or anything with me.

O. You have not a recollection as to whether you had any of the samples, whether you investigated any of the samples from the several cars of theirs that were seized, you know nothing about that?

At present, you mean, I would not like to say because I am not sure whether I had anything to do with the seizure

samples from there.

Q. And you could not give us anything about the results that you determined from those?

A. I don't remember anything in connection with this

Updike Milling Company.

- Q. Do you remember whether you had any of the Wells-Abbott & Nieman from Nebraska where the Government seized it?
  - A. I know we had a sample from the Wells-Abbott, but whether it was a seizure sample I don't remember.

Q. You have no recollection as to that?

- I usually kept the flours, samples, by numbers and did not always know the history of it.
- From your general information did you learn whether or not those were seized that the Government has seized?

A. I don't remember about the seizure samples.

- Well, did the Government get samples from those mills that were not involved in the seizures?
- A. Yes, sir; yes, sir, we [has] samples from them that were not connected with seizures.

O. You had some unbleached?

A. Yes, sir, we had both bleached and unbleached.

Do you know whether you had samples of the bleached from the Updike Milling Company, Wells-Abbott & Nieman, that were not involved under their seizures? A. Yes, sir.

Q. Do you know that they were not involved, though?

A. I felt pretty confident because it was before these seizures were made.

Q. When was it?

I should say that would be the summer of 1908, that would be two years ago this summer.

Q. Did you have any experience with flour from those mills in 1909? A. I would not be prepared to say now.

Judge Scarritt: We can't hear you.

A. I am not prepared to say because I don't know the history of all the flours that I have worked on; I had them by numbers; I am more familiar with them on that point.

Q. Prior to this seizure did you ever have any sample of the flour from this mill, the Lexington Mill & Elevator Com-

pany? A. I don't remember that.

Q. Prior to this seizure did you ever have any of their unbleached flour sent to you? A. I don't remember that either.

Prior to this seizure did you ever bleach any in your laboratory of the flour that came from this mill?

1065 A. Not to my knowledge.

- Q. Did you ever, prior to this time, make any examination of their flours at all? A. Not that I know of.
- Q. Have you had any examination of any flours from the mills in Missouri before this trial in your work here?

A. I don't remember exactly, but I think I must have had.

Q. Can you recall any? A. No, I do not.

Q. Do you remember whether you have had any flours from a mill up here at St. Joe, Clark's Mill, I believe it is?

A. I don't remember that either.

Q. Do you remember whether you had any flour from the mill of Waggoner-Gates at Independence?

A. Yes, sir, we had.

Q. Examined that, have you? A. Yes, sir.

Q. How recently?

A. That was two summers ago, two years ago.

Q. Have you had any of the Waggoner-Gates in the last two years? A. I couldn't say whether we have or not.

Q. Do you remember whether you had any flour from the Lexington Mills in Lexington, Missouri?

A. I don't remember.

Q. What mills do you recall that you had flour from?

A. I know we have had the New Ulm flour.

Q. Where is that?

A. Nebraska, and we have had "Aristos" flour.

Q. When did you get "Aristos" flour?

A. We have had that several times recently.
 Q. Bleached or unbleached? A. Unbleached.

O. You get any "Aristos" bleached flour?

A. No, none that was sent from the mill as bleached.

Q. You bleached that in your laboratory?

A. I don't believe we bleached any of the Aristos at our laboratory.

Q. Did you get any of the bleached flour from Kansas City?

A. Of this Aristos?

Q. Anybody here in Kansas City?

A. I don't remember any.

- Q. Do you recall of any flour that you got from Missouri, that was bleached?
- 1066 A. From Missouri. I don't remember, sorry to say.

  Q. Have you been in this chemical analysis department of the Government for two years?

A. Yes, sir, two and a half.

Q. Now, where were you engaged and employed prior to that?

A. Just prior to that I was teaching chemistry in the high school at Newport, Kentucky, for two years.

Q. For how long were you there? A. Two years.

- Q. And your work there was that of the teaching of chemistry? A. Instructor, yes, sir.
  - Q. And where were you employed prior to that?
     A. In the Woman's Medical College of Cincinnati.
  - Q. How long were you there? A. Four years. Q. And what was the nature of your work there?
  - A. Teaching chemistry to the medical students.
    Q. And [what] were you employed before that?

A. That was immediately after my graduation.

Q. And how long were you in school before that?

A. Well, I took the regular academic course, that is four years, in university work, and then followed it with a year post-graduate work.

Q. So that is five years you put in at that?

A. Put in at the university.

Q. So five years there, and four years in the medical school, two years in Kentucky and two years in the Government, that would be thirteen years. During that thirteen years you have been engaged either as a teacher of chemistry or in school yourself? A. Yes.

Q. Or in the employ of the Government. Now, where did

you attend school?

A. At the University of Cincinnati.
Q. There at your home? A. Yes, sir.

Q. Now, during your chemistry work with the Government have you been called upon to analyze different food products, especially from flour?

1067 A. Yes, sir.

Q. What other food products?

- A. Just whatever is sent to the laboratory.
  O. Well, what does that include, please?
- A. Spices and jams and jellies, preserves.
   Q. Does it cover meats at all? A. No, sir.

Q. Does it cover corn starch?

A. I have never had any corn starch to analyze.

Q. Have you ever examined any other food products for the purpose of ascertaining the presence or absence of nitrites? A. No, sir.

Q. Well, in your study of chemistry you became quite familiar with the subject of nitrites and their presence in different products, did you not?

A. Not to any great extent.

Q. As a student of chemistry and as a teacher of chemistry didn't it involve the subject of nitrites and their presence and their cause and their effect?

A. No, that would not come into my work, of course, the presence of nitrites and their nature, but not their physiological action, because—

Q. But the presence of nitrites, didn't it?

A. That is the production of nitrites in nature, and what nitrates there were, such as nitrous acid, such things, as looked upon from a merely chemical standpoint.

Q. Now, merely from a chemical standpoint state whether

or not you know about where you find nitrites?

A. Well, they are found as a result of decomposition in nature, decomposition of organic matter.

Q. Yes, sir, where else?

A. There are some in saliva as a result of decomposition.

Q. Do you know the amount in the saliva?

A. No, I do not recall the figure.

Q. If you find it in the mouth of a little infant child it is the result of decomposition, is it? A. Possibly.

1068 Q. Well, possibly not?

- A. I don't know enough about it, really, of the origin.
- Q. In your study of chemistry did you learn it was present in the mouth of an infant child?

A. I knew it was present in the saliva, yes.

- Q. Did you ever make any examination to determine the amount? A. No, I did not.
- Q. Well, in your study of chemistry did you learn it was in the atmosphere?

A. Sometimes, yes, in very minute traces.

Q. As a student of chemistry or a teacher of chemistry have you had occasion to weigh the amount or determine the amount? A. No, I never did.

Q. Is it in the rain as it falls?

A. Might be in a large city where the atmosphere is—as a result of various impurities, there might be some.

Q. In the city they would not be in the country?

A. Well, a greater amount of combustion going on and decomposition.

Q. Does combustion create it?

A. In the smoke, yes, might be.

Q. Combustion of what? A. Well, various—Q. Anything? A. I suppose any combustible material.

Q. What? A. I think would would, probably. Q. Burning up wood creates nitrites, does it?

A. I couldn't say from my own experience because I never-

Q. From your general knowledge as a student and teacher of chemistry what would you say to your pupils, say nitrites form from a combustion of wood?

I would say I think so, but I am not sure. A.

If it were the combustion of coal what would you say? The same thing, that I think so, but I don't know; I A. think so, but I didn't know.

Q. If it were the combustion of gas what would you say?

Possibly there too. A.

Q. And if the pupil had asked you if there would be nitrites in the kitchen where the housewife is burning 1069 coal, what would you have said to her, said to the pupil?

Possibly be formed there, but carried off through the

chimney.

Well, but if the heat comes out into the room what would you say as to whether or not that would create nitrites?

Why, but the smoke does not come out into the room. No, I am not speaking of the smoke; I am speaking of

Q. the heat; what would you have said to them if they asked you if there was nitrites formed by the burning of gas fumes?

A. Possibly a small amount formed there.

Some formed there? A. Possibly. Q. And the amount which is formed there would be in circulation through the room?

A. Well, it would be there for a time.

What would you have said as to whether food products exposed on the kitchen table would take up any of those nitrites?

A. I don't know whether there would be enough there to

show any re-action.

Q. What would you say as to whether different food products if being prepared for company, in the kitchen where a gas stove is, say, or where the gas light is burning, would you say that would take up any nitrites?

A. I hardly think so, not enough no notice.

Did you ever make any test of this? Q.

No. I have not.

Did you hear Dr. Marshall's testimony to the effect that corn starch took up two and a half parts per million, did you hear that?

A. No, I was not present during his testimony. As a chemist do you think that is possible?

Well, I do not really know because I never done work

in that line.

Well, I know, but I am just asking you for your scientific knowledge as a scientific chemist, as a teacher of chemistry would you say it was possible for corn starch to take up two and a half parts per million of nitrites?

I would not be prepared to say, because I

know.

1070 Q. You would not express any opinion upon that?

A. No, sir, not at all.

Q. You wouldn't say it could not?

- A. I wouldn't say it could not, and wouldn't say it could, because I don't know.
  - Q. You don't know but what it could take up some? A. Possibly a small amount, but a very small amount.
- Q. Would you regard two and a half parts per million as a small amount? A. No, that would be considerable.
  - Q. That was a good deal more than you found in this flour?

A. Something more.

Q. And if corn starch did take up from the air two and a half parts per million, that is, it took up considerably more than is imparted to this flour by this process, wouldn't it?

A. Something more than that.

Q. It would be the same form as nitrites?

- A. If bleached there as nitrites, I suppose they would be the same.
- Q. Now, if you had some corn starch in which nature had imparted two and a half parts per million, and you had mixed that up with the Griess re-agent the same as you mixed this biscuit that is marked Exhibit 34, I think it is, you would have had the same color?

A. I never had corn starch containing nitrites.

Q. Let me have your opinion, if you took corn starch in which nature had imparted nitrites equal to two and a half parts per million, and you had mixed that up with this Griess reagent until you had a sticky mashy stuff you had in this, wouldn't you, it would exactly be the same color?

A. If the nitrites were present to that extent, I think that

the color would be brought out.

Q. Anything which had nitrites in it in an equal amount, whether imparted by nature or the Alsop process, would show the same discoloration? A. Well, probably.

Q. And if you took meat that had been smoked, or if the smoke came in contact with it, that is a product of com-1071 bustion, and nitrites had been imparted to the meat

by that process, and then you drew some of the liquid from the meat, or soak it in bread, and then apply that same solution, wouldn't you get the same color?

A. I don't know anything about the smoked meats con-

taining nitrites.

Q. No, but I am assuming that it does, and that you draw it off and get the liquid containing the nitrites, and then apply this same Griess re-agent that you applied to this, wouldn't you create the same result?

A. I suppose any substance that contains nitrite re-acting material would give you that pink coloration that the Griess

does.

Q. No matter where you apply the Griess re-agent?

A. I think so.

Q. Then if you took bacon which had 1.8 parts per million or two parts per million, bacon that had been put in by the curing process, and you drew the fluid off of that and then apply your Griess re-agent, you get that same color?

A. If the nitrites are there I suppose you get it, only I

don't know anything about the presence of nitrites there.

Q. Do you know what is the effect of salt or saltpeter in curing meats as to whether or not that imparts nitrites?

A. I don't know.

Q. Have you never made a test of that? A. No, sir.

Q. But from your scientific knowledge of chemistry would it? A. I don't really know.

Q. Can't you as a chemist tell us what would be the effect

of curing meats with salt or saltpeter?

A. No, I never read much on that, or investigated it.

Q. I know; what would be the effect on any meats, curing them as they are ordinarily cured in the packing houses, or as they are cured, or the different places where they are prepared, do you know what would be the result of that?

A. No, I do not.

Q. As a chemist can you tell me what would be the result if a farmer cures his meat, salts it down, pickles it, as we sometimes say, do you know whether or not that would impart nitrites?

. I do not really know.

Q. Well, if it did impart nitrites to it and you apply the Griess test, it would color the same as this biscuit?

A. As I said before, everything that contained nitrite

re-acting material would give you that coloration.

Q. If from a little child you should collect its saliva, in a tube like that, in a tube that is marked Exhibit 29, if you should collect the saliva of an infant child nursing at its mother's breast, in that tube, and then apply your Griess re-agent, would you get the same color as you do of this?

A. I don't think you get anything like that color at all.

Q. Did you ever sample it?

A. I have made a test of saliva, yes.

Q. Didn't you get the pink coloration there?
A. It was very hard to see, very hard to see.

Q. When did you test that?

- A. When I was teaching in the medical school.
- Q. But you did get the pink discoloration, did you?
- A. Well, I think I saw it, but it was very a very unsatisfactory test.
  - Q. What were you testing?

A. Just to demonstrate to the pupils the presence of nitrites there.

Q. In what?

In the saliva, and we tried very hard, and it was a most unsuccessful test.

Did you get any pink discoloration at all in the experiment you performed there?

A. As I say, I thought I got a faint trace of it, but it was so faint that the pupils wouldn't say that they had seen it.

Well, if you saw any pink there it was because nitrites

were present? A. Yes, sir.

If you take absolutely pure water or absolutely pure saliva and subject it to this treatment, it don't show any discoloration at all, that is, if it is free from any 1073 nitrites?

A. No, it wouldn't show anything.

- Q. But if there be nitrites there at all it will show it, will it?
- A. Well, as I say, it must be there in very small amounts because we were not able to detect it.
- Q. Now, did you hear the testimony of Dr. Jones, I think it was, of New Orleans, who, as I recall it, testified in the human saliva there is sometimes as high as I think he said, ten parts per million? A. I did not hear Dr. Jones' testimony.

If there were ten parts per million in a human's saliva, what would it show, if anything?

A. Ten parts to a million.

Ten parts to a million would be a good many times what you found here, wouldn't it? A. Yes, several times.

Q. So no matter whether we find it in meat or in flour or in the saliva or corn starch, or where you find it, if you subject it to this Griess reagent treatment, it shows up pink, don't it?

A. Yes, I think that is the test for nitrite re-acting material wherever found.

Q. And if I had some corn starch in one of these small receptacles that Dr. Marshall said he found contained two and a half parts per million and I subjected that to the treatment of this Griess reagent as you did this biscuit, how would the color which I would get from that, compare with the color of this biscuit you made?

A. Well, if there were that much nitrite re-acting material there, of course I don't know whether there would be, if there were, I think it would give you a pink coloration comparable

with that.

Q. Well, you mean equal to that? A. You said 2.5.

2.5? A. Probably just a little bit better than that. Q.

Be a little pinker that that? A. Possibly.

Q. And yet the corn starch as you look at it would be perfectly white, wouldn't it? A. Yes, sir.

Q. Now, what is it that does it, is it the corn starch

1074 that turns pink when I put that on there?

A. I think Dr. Hulett gave a very good explanation.

Q. Never mind what Dr. Hulett said; what do you say it is? A. Well, I can only repeat what he said.

Q. I don't remember what he said I prefer having it original from you; what do you say, is it the liquid which turns

pink?

A. It is neither the one nor the other. It is the re-action between two substances that are present, the nitrites in the flour show in these various substances, with this combination of sulphanilic acid and the hydrochloride in this color compound.

Q. What is the composition of this Griess re-agent?

A. It is made of two substances, sulphanilic acid dissolved in acetic acid; it is a solid; it is dissolved in acetic acid. And the other portion is made of alpha-napthy-anine-hydrochloric, dissolved in acetic acid.

Q. Now what is acetic acid mde of?

- A. Well, acetic acid contains carbon, hydrogen and oxygen.
- Q. How much carbon, how many parts? A. Two parts.

Q. And how many hydrogen? A. Four.

Q. And how much oxygen? A. Two.

- Q. Now, is that a combination of these different elements, is it? A. Yes, sir.
- Q. You don't get acetic acid in that combination as made by nature, or does the druggist make it?

A. I think it could be formed in nature, yes, certainly, it

is formed.

Q. If you go to the druggist and call for acetic acid you can get it in a bottle, can you? A. Yes, sir.

Q. Now, is that the result of a combination of different

elements together?

A. Oh, no, he derives it from something else or the chemist who prepares it derives it.

Q. That is, the chemist took different elements in com-

pounding that? A. Yes.

Q. From what does he extract it?

1075 A. Well, a great deal of acetic acid is made by the oxidation of alcohol.

Q. That is where they get the foundation for it?

A. I think a good deal.

Q. Well, now, according to these tests that you made here, is it obtained from woody substances—acetic acid?

A. It can be obtained from woody substances, yes, sir.

Q. What kind of wood? A. Well.

Q. Decomposed?

A. I don't know whether it is-it may enter into decomposition of wood, that is, it might be in soil decomposition it might be.

Q. Well, now, what is this other substance derived from that

you use to make up this re-agent?

- A. Acetic acid though, that is a synthetic compound, I don't remember, it has been so long since I have been connected with that kind of chemistry that I have forgotten, largely, I would not like to make statements.
- O. Well, this Griess re-agent to which you subjected this in order to determine the color is known in chemistry to be the most delicate which is known to chemical science, isn't it, for the purpose of detecting the presence of nitrites?
  - It is a very delicate test for nitrites, ves, sir.

The most delicate test of science, isn't it? Q.

A. I think so, yes.

And so delicate is it that it will detect it if there is only one part in ten or one hundred millions, won't it?

A. I don't know just the limit of it.

What is the limit, so far as you know? Q.

I couldn't say now. A.

Could you detect it where it is in a greater state of solution than one in a million. A. Oh, ves.

One in ten million? O.

- That would be one-tenth, yes. A. Well, be one in fifty million? Q.
  - A. I don't know how far it goes beyond one-tenth.
- But you know it will run one-tenth in ten millions? 1076 Q. - A. Yes, sir, I'm sure.
- In other words, do you mean-is that measured by volume or weight?

By weight. A.

So, if you had one ounce of that in weight-

A. And I am referring to the nitrogen, I beg pardon for interrupting.

Q. Yes, nitrogen.

That is nitrogen as nitrite, in nitrite dissolved. A.

- Well, I mean nitrogen as nitrite, so if you had one grain of nitrogen as nitrite in fifty million grains of it, this test is so delicate it would detect it, wouldn't it?
  - I don't know now about the fifty million because-A.
- Pardon me, I didn't mean to put it at fifty; I meant to say ten million. A. Yes.
- Q. If you had one grain of it in ten million grains of the other? A. Yes

Q. It would detect it? A. Yes.

Q. So minute, and would show the pink coloration?

A. Yes, sir.

Q. Now, getting that down to quantities we can comprehend a little better, if I had a pound of it put in with ten millions pound of flour, this test is so delicate that it would detect it, wouldn't it?

A. One part in ten million could be detected, yes, one

part of nitrogen.

Q. To get that down where we can comprehend it a little better, a million pounds of flour would make about forty carloads, ten million pounds would be four hundred.

Mr. Butler: One moment. These questions, it seems to me, are purely a repetition of the result of a manifest computation.

Mr. Smith: I am trying to show how extremely delicate this test is.

Mr. Butler: It has been stated over and over again and the same speech has been made a great many times, and 1077 my idea is we will proceed faster if we would save our speeches until the evidence is all in.

Mr. Smith: I think I have got a right to cross-examine this witness. We will get through with this in less time than it takes you to state it.

Mr. Butler: I know, we want to set a [precedence] so you will confine yourself to something that has something to do with the case.

Mr. Smith: I don't think we are consuming time here unnecessarily.

The Court: Well, go ahead.

Q. If it be true, then, that a million pounds would make forty carloads, this is so delicate that if you had one pound in four hundred carloads, this Griess test would detect it, wouldn't it?

Mr. Butler: I think I will enter an objection to that, not calling for information, it is manifestly a mere mass of arithmetical computation; it is not a test of the witness.

The Court: Well, I am going to save my talk about this case until you gentlemen are all through. At that time I am going to make a few observations to the jury, and whether they will be mild observations or not, I can't tell; that is, I won't tell; I could tell. As I understand it the Griess test is denounced because it is so accurate, is that it, so accurate?

Mr. Smith: No, I am not denouncing it at all.

The Court: Go ahead.

Mr. Smith: I am not finding fault with it, in the least.

The Court: Go on, go on.

(Question read by the reporter.)

A. Why, I would have to-

- Q. Now, in making the bread that you did in this case, and which was exhibited to the jury, did you use what you term the Koelner method or the domestic?
  - A. The bread that Dr. Hulett used, you mean, or this?

Q. This exhibit that you put in.

A. I have bread made from both methods.

- Q. Now describe them to me, the Koelner method as you used it?
- A. The Koelner method is—in that I used 340 grams of flour with 5 grams of salt and—
- Q. Pardon me, these measurements, you know, I don't think the most of us understand. 300 grams of flour would be about how many ounces?

A. About twelve ounces.

Q. About twelve ounces of flour?

A. And 5 grams of salt would be about 1/6th of an ounce, that is, just roughly.

Q. 1/6th ounce salt.

- A. And 10 grams of yeast, is about 1/3rd of an ounce,
- Q. Yeast 1/3rd of an ounce—pardon me, what kind of yeast did you use?

A. I used compressed yeast.

Q. What is the name?

A. The yeast we usually used is Callahan's.

Q. What else did you use?

A. And 12 grams of sugar which would be between a third and a half, I forget just what it is now.

Q. Of sugar, these were all the ingredients?

A. Then the water determined by the observation of the flour, that varies.

Q. How did you determine that?

A. Weighing out a certain quantity, 30 grams of flour, and doughing it up with a certain fixed amount of water, and finding whether it will make a springy and elastic dough. If the amount that you begin with is not sufficient, you take just a tiny amount, well, of course, it is always measured, and shake it up again, finding whether it gives you the proer consistency to work smooth.

Q. You kept adding flour until you had it to proper consistency?

A. I added the water, I started with a certain amount of flour and added water.

1079 Q. Do you know how much water you actually added in each instance? A. Yes, sir, I kept a record of that.

2. What was the amount in each?

A. In this particular case, 305 cubic centimeters, which is something over—between six and seven liquid ounces, I think somewhere near seven.

Q. The same in each one?

A. Each flour requires its own amount to get the dough the proper consistency.

Q. That is what I was aiming to ascertain, the amount dif-

ferent flours required, different amounts of water?

A. Yes, sir.

Q. You could not fix an arbitrary amount to put in each one?

A. No, the dough would be too soft in [same] cases and too stiff in other cases.

Q. Now, in the Koelner method how long did you let it set?

A. Why, in the Koelner method we mix it together for ten minutes and then knead it for ten minutes. I should add that one-third of the flour is kept back, for the kneading purpose two-thirds taken at first to mix up and one-third retained and taken for the kneader, then the dough is taken from the kneader, molded into a loaf and set in a pan and set it in the closet to raise.

Q. How long did you let it raise?

A. Until it reaches a certain stage.

Q. I ask what that is?

A. It would vary with different plans.

Q. What were the variations?

A. Oh, they were, if I go over all my experience, varying-

Q. Can't you give us the limits, two hours or four hours, or

whatever the fact was that way?

A. From perhaps less than an hour to two hours and a half. Some loaves set for an hour and some for two hours and a half at different times; they all raise to the same height exactly before they would go into the oven; then they were baked until they lost just 30 grams moisture which would be about the weight of one ounce.

Q. So in determining when to put it in the oven you governed yourself wholly by the time it took to rise to a certain

level? A. Yes.

1080 Q. And after you put it in the oven you let it bake until it has lost a certain amount of moisture?

A. Yes, sir.

Q. That is what determined you in taking it out of the oven? A. Yes, sir.

Q. You think that is what the average housewife goes by when she takes the bread out of the oven?

A. She goes by guess, if she thinks it is done; we find that this gives us a loaf that is done.

Q. Now, in making it by the domestic method how did

you do it?

A. There I use three-quarters of the flour and made a sponge, with the yeast and the salt, the yeast was less than in the former case, being about one-fifth of an ounce, the salt was just the same, five grams, or one-sixth of an ounce, about, made a sponge and let it rise until it had just doubled its volume.

Q. By measurement?

A. Yes, then kneaded it with the balance of the flour, and the sugar, which was a little less than in the former case, this time, 10 grams, say one-third of an ounce, and I usually kept back a portion of the water in making the sponge so that I would be able to get the right consistency later, because the flour is always wet, we always have a definite amount of flour and the water we can change or add as we find it necessary.

Q. Yes.

A. I think a housewife, however, would generally add more flour, but of course we were making the comparisons, we had to be fair to every flour, and would always use the same amount for comparison; that was the only reason for not putting in the water at first; this was kneaded then for ten minutes and put back in the crock in which it was received, set in the window to raise the second time.

Q. How long did it raise the second time; how long did that take? A. Well, that would vary, too.

Q. You reached what results?

A. I don't remember the time for the second raising exactly.

Q. Well, about what was it?

A. Well, perhaps an hour, an hour and a half; and then it was ready for the working down a third time and the molding into the pan, then left in the pan again until it reached the gauge.

Q. How long did you let it remain there?

- A. Well, there again it would vary perhaps from half an hour to an hour.
- Q. But you just let it set until it reached a certain gauge as you said?
  - A. Yes, so that we could have fair comparisons of all.
  - Q. And then put it in the oven? A. And baked it again.
  - Q. Until it lost a certain amount of moisture?
  - A. We determined that by the loss of weight, yes.
- Q. So in determining when to remove it you went to look at the amount of moisture that it had lost?

- A. Yes, sir, because that is a little more definite than the other way, but I could tell almost exactly by the length of time just as a housewife about how long it takes to bake the bread.
- Q. She goes a good deal by the looks of the loaf as to when it is done? A. Yes, certainly.

Q. You go by the amount of moisture that it has lost?

A. Because we had the oven at a certain temperature, and these things are a little more regular than the housewife's.

Q. Now when you made these biscuits that have been offered here where you mix them with the Griess re-agent, of course no person would—you never heard of a person who pretended to prepare biscuits that way?

A. I would not like to do it myself.

- Q. Even that which is made of the unbleached flour, you would not say that was palatable or fit for food?
  - A. No, indeed, it was not intended to be. Q. It is wholly unfit for food, isn't it?

A. Yes, sir; yes, sir.

Q. It would be just as deleterious or injurious or nauseating as the other would be, wouldn't it?

A. I think it would be just as nauseating because that reagent is very disagreeable.

Q. Yes, sir, is it injurious? A. I should think so.

- Q. Suppose I take this biscuit made from unbleached 1082 flour made as you did there, suppose I ate it, would it have a deleterious effect on me?
  - A. I would not like to have you do it.
    Q. You think it would be injurious?

A. I am afraid it would.

Q. As a matter of fact you put into it an exceedingly poisonous and dangerous substance?

A. Oh, we simply used that re-agent to see what the effect

would be.

Q. None of this, of course, you don't pretend to prepare that according to any rule for preparing human food or food for human beings?

A. Not where the re-agent is used, no, sir.

Q. It is simply to show what would be the effect of the reagent on the different kinds of flour? A. Yes.

Q. And for the purpose of demonstrating that there was a

certain amount of nitrite in it? A. Yes.

Q. No housewife in the preparation of any food uses this reagent? A. No, I never did before in my life.

Q. No, it is never used around the kitchen, is it?

A. No, sir.

Q. And no article intended for food would ever be mixed that way? A. Well not with that Griess re-agent, no.

Q. That would destroy it absolutely, wouldn't it?

A. Yes, sir.

Q. In making these biscuits that you use here for demonstrating the effect of the reagent can you give me the amount of flour you put in each of these biscuits?

A. I took 125 grams of flour and used that in making the

three-125 grams made three biscuits.

Q. Three biscuits, so each of these biscuits contained one-third of that? A. One-third of that.

Q. Then in each biscuit you used what amount of the reagent?

A. Why, I used—the re-agent I used 23 cubic centimeters.

O. In each biscuit?

A. Well, each one that I used the re-agent in.

Q. Yes, this one that has been offered in evidence here?
A. With the strong re-agent, yes,

1083 Q. There are 23 CC now in that biscuit?

A. Yes, sir.

Q. And what were the other ingredients of that biscuit?

A. Well, I mixed up that flour and the salt and baking powder and lard first.

Q. Now how much salt?

A. I used 125 grams of flour, three grams or salt.

Q. All right.

A. Four grams of Royal Baking Powder and 20 grams of lard.

Q. That was for the three biscuits?

A. Yes, for the three biscuits.

Q. For each individual biscuit you put the 23 CC.

A. One-third of that.

Q. 23 CCC means a great deal to you but nothing to us?

A. It is a good deal less than a liquid ounce; I can show you better—

Q. Show me in this, as compared to that you have there

(showing flask to witness)?

A. It would be just about there, that amount of liquid (indicating on flask).

Q. What is that exhibit you have there? A. Exhibit 26.
Q. It would be an amount equal to what proportion that could be held by "Exhibit 28"?

A. About three-fourths of that.

Q. About three fourths of that, of this reagent, was mixed up with the flour that went into that individual biscuit?

A. Yes, sir.

Q. That is all.

#### Redirect Examination

By Mr. Butler:

Q. Was this same re-agent used in the biscuit made from the unbleached flour? A. Exactly the same.

Q. Both were treated alike?

A. Yes, sir, in every respect.

Q. You told Mr. Smith that in your work in the laboratory you sometimes had bleached flour that was bleached at 1084 the mill. Some mills bleach where electricity was em-

ployed, and some where nitric acid was employed and chemicals and so forth. Have you ever observed any difference in the flour which would be attributed to the method of producing the bleaching medium, as to whether it was produced by the electric flaming arc or the nitric acid?

A. None at all, they all seem to be derived the same way.

Q. Now you also told Mr. Smith that sometimes you experimentally bleached it in the laboratory and made NO2 gas by some salt of iron and nitric acid or something of that sort. Now in your experience with flours bleached to like degree in the laboratory to these bleached by milling methods, was there any difference observable? A. None at all.

Q. Now something was said to you about the different mills that the flour came from and so on. How are your samples identified for use in the laboratory and making of the records?

A. They have numbers given to them by the inspectors. Q. Called Interstate numbers, I. S., number so and so?

A. Yes, certificate number so and so.

O. And you take them by the number?

A. Yes, I get them with the number, and very often I don't know the history of the sample; sometimes I do.

Q. But the history would be derivable by tracing them from the numbers?

[Q.] Yes, the inspector can always furnish the information.

Q. With that you have nothing to do. Are some substances said to be acid and some said to be alkaline? A. Yes.

Q. Reference was made to the testimony of Dr. Marshall as to the effect upon corn starch, and my recollection is that he did not state, Mr. Smith, the amount recoverable from the acid or alkaline solution. You read something to him from a paper and he said he would affirm that you are right if it was an official record, and you said that you couldn't tell whether it was or not. I think that is the exact state of the record upon that point.

085 Mr. Scarritt: A copy of his testimony.

Mr. Butler: Mr. Smith said that it purported to be from the testimony.

Mr. Scarritt: Do you deny that?

Mr. Butler: No, I do not, but I don't want Mr. Marshall quoted as having said anything other than what he did say.

Judge Scarritt: We can get it certified, of course.

Mr. Butler: Mr. Smith said that he could not affirm that it was official. He said he was sure it was right if it was official, but you said you couldn't say whether it was official or not, and I have not the slightest information on that point, but I know what occurred.

Judge Scarritt: He said it was a copy of his testimony in that case.

Mr. Butler: If Mr. Smith now says that it was official, it is enough for me.

Judge Scarritt: Do you mean certified?

Mr. Smith: All I got to say is that it was furnished me by the reporter who took it down; he did not certify to it, .though.

Mr. Butler: If the decimal point was in the wrong place it would vary ten times. He said if it was the official record it was right, that is what he said, and you would not say it was the official record.

By Mr. Butler: (Resuming)

Q. Now as to the degree of the tests, do I understand that the stronger the nitrites the stronger the color?

A. Yes, sir.

- And you say these saliva tests that you made that the color was slight?
  - So slight that I was not sure that I could see the pink. A. Q. And your pupils insisted that they could not see it?
- Yes, they didn't think it was a very satisfactory test. A. Didn't look much like the test with "Exhibit 30" here that came out of this bread that you made from 1086

the bleached flour that was seized and given to Dr.

Hulett, did it? A. Nothing at all like it.

No, did not look much like that. Now the quantities of the nitrite reacting material are measured by the color?

Yes, sir.

Now you said that you baked bread under one of these methods in which three grams of the water was eliminated?

A. 30 grams.

Q. Now how much water was put in. I want to find out how much water stayed in when you baked it?

A. 205 cubic centimeters were put in this particular flour. that was the absorption for this particular flour, and it varies

with different flours, but not a great deal.

Q. What I am trying to get at is this, that generally in baking by the domestic method the percentage of water onetenth eliminated by the baking, roughly or approximately, it would vary in different loaves, I understand, in different flours, but it is of some interest to know whether you baked all the water out or only part of it, and if only part of it, what part of it?

A. About 14 per cent, a little over ten per cent.

Q. About 10 per cent is baked out? A. Is baked out.

Q. So from 85 to 90 per cent of the water added to the flour remained in the bread? A. Remained in the bread.

Q. And the comparison of the measurement will be by this color method and the amount of nitrites is compared, the weight of the nitrites against the weight of the air, and the weight of the flour first, and then the weight of the air?

A. Yes, first against the bread, and then calculate to the

flour that is present there.

Q. So the increase in weight of the bread by the addition of this quantity of water which remains in the bread would itself dilute, would it not, the nitrites? A. Yes, sir.

Q. So that even though there was the same, absolutely 1087 the same amount of nitrites in the bread, as there was in the flour, made from it, because of the increased part being pure salt and pure water and the other ingredients that

stayed in the bread, it would make a more dilute test?

Q. Well, we take the weight of it, we take a certain weight of bread, and of course that weight of bread would not have that same weight of flour; besides the flour we would have some of these other ingredients and some water, so there would he less.

Q. After water and salt and sugar and whatever you put?

A. Yes, so that it would, as you say, really dilute it, because there would be less than that same weight of flour there.

Q. I think that is all.

Dr. S. F. Acree, called as a witness on the part of libelant, being duly sworn, testified as follows:

#### Direct Examination

By Mr. Butler:

Q. S. F. Acree? A. Yes, sir.

Q. Where do you live? A. Baltimore. Q. What is your occupation, profession?

A. I am associate professor of organic chemistry in John

Hopkins University.

Q. And what has been your education, degrees and experience—work along the line of organic chemistry and similar subjects?

A. I graduated with the degree of Bachelor of Science in the University of Texas in 1896; I was assistant in the 1088 University of Texas in 1897 and received the degree of

Master of Science. In 1898 to 1901 I was in the Uni-

versity of Chicago, doing graduate work. I was also assistant and fellow there during that time. In 1902 I received the degree of Doctor of Philosophy. From 1901 to 1904 I was associate professor of chemistry in the University of Utah. In 1903 and 1904 also, on leave of absence I was in Europe, at the University of Berlin. From 1904 up to the present time I have been connected with Johns Hopkins University.

Q. Now, what is organic chemistry?

- A. Organic chemistry is that part of chemistry which has to deal with the carbon compounds. The name "organic" was given to that part of chemistry because most of its compounds were thought in earlier days to be formed by organized things such as plants, animals, by lower organism too, as far as they were known.
- Q. And have you pursued the study of any other department of chemistry?
- A. I was assistant city chemist is Chicago in the year 1904, part of the year. I have done work in the lines of physical chemistry and I have done some work with enzymes.

Q. Are you familiar with the substance known as NO2 or nitrogen peroxide gas, sometimes written N2O4? A. I am.

Q. What is that substance?

- A. It is a gas containing as chemical constituents, chemically combined, nitrogen and oxygen. The gas is heavier than air. It is a substance which is very irritating when it is inhaled. It makes one sick if he has to work with very much of it. When taken into the lungs it is a very powerful oxidizing agent. It is used in oxidation to destroy organic compounds, and it is in, for instance, concentrated nitric acid.
  - Q. Have you ever seen an Alsop bleacher work?

A. I have.

Q. Where.

A. At the Southwestern Milling Company in this City; the mill was called the Rex Mill, I believe.

Q. When was that? A. Last Saturday.

Q. Did you see some flour bleached right there.

A. I did.

1089 Q. Was that the occasion Professor Hulett was there?
A. It was.

Q. Referred to in his testimony? A. It was,

Q. Did you yourself make a qualitative analysis of flour that was bleached at the same time while the thing was running in the same way that it was when Professor Hutlett took some gas in a flask which he exhibited here, or like the one he exhibited here? A. I did.

Q. What amount, if any, of the nitrite reacting material was added to the flour by that particular treatment, of that

dilution of the medium?

A. We collect a sample of flour that had been bleached and which was leaving the agitator and analyzed that flour, when I returned to this laboratory, and I found .6 or a milligram of nitrite reacting material expressed as nitrogen in each kilogram of flour.

O. That would be .6. A. .6.

Q. Of a part to the million? A. Yes, sir.

Q. Of nitrite reacting material calculated as nitrogen?

A. Nitrogen.

Q. Do you know whether or not the gas generated by the flaming arc was at the time of the bleaching in question connected with more than one agitator?

A. It was connected with four.

Q. Connected with four? A. Four agitators.

Q. Now, after Dr. Hulett had taken the gas which he analyzed was there any change made in the connections of the machine to various agitators?

A. There were three of those agitators cut off, and the gas was then allowed to flow through only one of the agitators, the one nearest the point from which I took the gas.

Q. Did you yourself take some gas? A. I did.

Q. Where did you get it with respect to the place that Hulett got his? A. At the same place.

Q. Did you determine the degree of—was that while all of the gas was running into the one agitator?

A. It was.

1090 Q. Did you determine the degree of concentration of the gas mixed with the air that you took? A. I did.

). What was that in parts?

A. When I analyzed that gas I found in each litre of air

1.1 cubic centimeter of nitrogen peroxide.

Q. Doctor Hulett expressed the quantities he found in terms of NO2 to the million parts of the mixture, as I take it, and he gave his determination as 300 parts to the million. Now, expressing yours in the same way what was your determination?

A. This would be then 1100 volumes of nitrogen peroxide

to the million part-

(Question read by the reporter)

A. My determination was 1100 volumes of nitrogen peroxide to the million volumes of air.

Q. Can you tell us what is the first thing which takes place chemically upon the application of this Alsop bleaching medium to flour in the agitator? A. The nitrogen peroxide combines with the mixture, to a large extent, and forms nitrous acid and nitric acid.

Q. Describe the characteristics of each.

A. The nitric acid is a very powerful chemical re-agent. It is used in concentrated form as one of our strongest oxidizing agents; when it gets on the flesh, for instance, it has a terrible action. I have seen some cases in which the concentrated acid has come on to individuals and causes a terrible swelling of the hand. I remember one case in which the nitric acid accidentally got into the mouth of an individual and it ate all of the lining of his mouth out, so that he could not take any food at all for a few days and liquid food only after that for some time; the man was in a very bad way. The nitric acid when brought into contact with organic substances such as flour, as we have here or with starch, sugar, with wood, or with any number of organic things, decomposes them very badly.

Q. Now, as to the characteristics generally of the nitrous

acid.

A. The nitrous acid is, to a certain extent, an oxidizing agent. It has the acid properties of most acids, that is, 1091 when mixed with substances like sugar, for instance, it hydrolizes, that is, decomposes this, and it behaves very much like other acids; you cannot get it perhaps in as concentrated state as you do other acids.

Q. Well, does it exist of itself in solution or is it always

in solution, in water?

- A. It has not, as far as I know, been isolated, not mixed with anything else; as we know it ordinarily it is in solution in water.
- Q. Now, patent flour being treated by this gaseous medium consisting of NO2, and diluted with air, are you able to tell us whether or not any chemical changes work in any of the constituents of the flour?
- A. I am able to say something about that. I have made some experiments on the action of these gases and of the nitric acid formed, and other substances analogous. The nitric acid in contact with flour decomposes the flour; it generates nitrogen peroxide; it acts upon certain constituents of the flour and forms other acids. If you care for the quantitative data I can—

Q. Well, you say it acts upon certain constituents of the flour, decomposes them?

A. It acts upon the gluten, for instance, and it decomposes the starch, which is a large constituent of the flour. It furthermore acts upon the fat of the flour in that it bleaches that fat. I have here some samples. Q. Well, as bleaching is the purpose of the treatment, let us speak of that first. Now, what effect has it upon—where is the coloring matter of the flour?

A. It is chiefly in the fat. If you extract the flour with ether, or with petroleum ether, you extract the fat, and you

extract the chief part of the coloring matter.

Q. Then it acts upon the coloring matter which is not so associated with the fat?

A. Yes, and it further acts upon the fats themselves.

Q. Now have you made any demonstration of its effect upon the coloring matter and upon the fats themselves?

A. I have.

Q. How?

A. I have taken some of the fat that was extracted from unbleached flour, and I have dissolved that in chloroform.

Q. Now what flour do you characterize as unbleached flour?
 A. This I will have to get that from the gentleman
 1092 from whom I got the fat, Dr. Winton.

Q. From whom you got the fat or the flour?

A. Yes, sir, the fat.

Q. Now let me see; did you take the fat yourself from the flour?

A. No, I took the fat as it was given to me.

Q. Oh, yes, Dr. Winton furnished you some fat taken, as you understood, from the unbleached flour?

A. Yes, sir.

Q. Now did you have some taken from the bleached flour?

A. I myself took some fat from the bleached flour.

Q. What flour?

- A. The number of the sample of the flour is I S No. 9126 B, as I understood.
  - Q. Did you test it to see whether it was bleached or not?

A. I did.

Q. Was it bleached flour? A. It was.

Q. Gave nitrite reaction then? A. Yes, sir.

Q. Did you make a quantitative determination to show the extent? A. No, I did not.

Q. Well, have you tested the seized flour which is here in court, by the drop test, dropping Griess re-agent on it?

A. I have.

Q. Now, how did this bleached flour that you took the fat from correspond with that, as to the degree of the nitric reacting material?

A. The unbleached flour so-called, unbleached flour, gave at most only the faintest indication of any test, whereas the bleached flour gave a very decided test by the Griess reaction.

Q. I meant to ask you concerning the bleached flour from which you extracted the fat in the experiment that we are about to enter upon. How did the degree of bleaching in that compare with the degree of bleaching of the seized flour here in court and which you say you tested?

A. They were the same sample.

Q. Oh, it was one of these samples? A. Yes, sir.

Q. One of these samples in court, have you the exhibit number?

A. The bleached flour is I S No. 9126, that is as I understood from Dr. Winslow.

Q. But you did not get the court's numbering of it here.

1093 A. This seizure No. 13.

2. That is exhibit?

A. Exhibit No. 13, beg pardon.

The Court: What is 13, I have forgotten?

Mr. Butler: It is a sack of this flour, the sack of bleached flour that Mr. Winslow brought up here, from Mr. Terry, under the order of the court.

The Court: Of the seized flour?

Mr. Butler: Of the seizure.

Q. Now it was that same flour. Now, have you specimens of the oil or fat of these two for comparison?

A. I have.

Q. The fat from the unbleached, furnished you by Winton, and the fat from this seizure, Exhibit 13?

A. I have them here, extracted in gasoline.

# By the Court:

Q. Extracted in what?

A. In gasoline. The unbleached flour when extracted with gasoline this substance on the right, Your Honor may see and the jury, which has a yellow color; the bleached flour in gasoline gave us this one on the left, which has less color. We took—

# By Mr. Butler:

Q. Just a moment. The one in your right hand I will have marked first Exhibit 43, and the one in your left hand I will mark next as Exhibit 44. Exhibit 43, as I understand you, was from unbleached flour?

A. It is, that is from unbleached flour.

Q. And Exhibit 44 is from Exhibit 13, the bleached flour, a part of the seizure in this case? A. It is.

Q. Well, did you get the unbleached flour from Dr. Winton too? A. From Dr. Winslow.

Q. Dr. Winslow. What is the I S number on that?

A. The unbleached flour is I S No. 9127 B.

Q. That is the diluted flour Exhibit 12?

A. Exhibit 12.

Q. Made by the same mill and testified to by Mr. Leflang, as you recall?

The Court: That came from the Lexington Mill?

Mr. Butler: It was a part of the flour that was sent.

The Court: As a substitution to this grocer down at Castle?

1094 Mr. Butler: Yes.

Mr. Butler: Exhibits 43 and 44 are offered in evidence.

Mr. Smith: I have no objection.

By Mr. Butler:

Q. 44 is the unbleached, isn't it? When was this flour put in the gasoline? A. This morning.

Q. And is there anything else to the test except the putting

of the flour into the gasoline?

A. That is all; the vessels were carefully cleaned; they were shaken thoroughly to get the fat extracted from it.

Q. And what was the gasoline added to the flour for?

A. The gasoline extracts the fat from the flour, and of course the coloring matter.

Q. And the coloring matter, the fat and all, rises into the gasoline?

A. To the gasoline.

Q. And in that way to some extent, at least, the solution gasoline containing the fat indicates the degree of attack upon the coloring matter of the oil? A. It does.

Q. Now you said also that nitric acid acted upon the fats; this determination is distinguished from the coloring matter

of the fat?

A. The fats are readily decomposed by all acids in the presence of water, the water itself entering into combinations with the fat and forming glycerine, palmitic acid, stearic acid and oleic acid, when it went into decomposition. Furthermore the nitric acid acts as an oxidizing agent, destroying the oleic in another manner which I do not intend to enter into here; it would be rather too complicated I think.

Q. Well, now, can you tell us definitely, have you any experimental proof or demonstration that HNO3, the nitric acid, acts upon the substance of the fat as distinguished from the

color? A. No, I have no experiments myself.

Q. Now, as to the degree of chemical change worked in the oil itself or the fat, on what does that depend?

1095 A. The degree of that change would depend upon the amount of nitric acid; however, speaking now of that

one reaction, the reaction of nitric acid, it would depend upon the amount there, all other things being equal.

Q. And the character of the substance produced by the ni-

tric acid?

A. The nitric in decomposing these fats would produce nitrogen peroxide and nitrous acid, palmitic, stearic and oleic acid, when we subject the nitrogen peroxide to the same reaction this chemical action would be possible.

Q. Are these substances which could be produced by nitric acid in the oil a nutritive substance, an improvement upon it

as it was, or an injury to it?

- A. Well, I should say from my experience that the nitrogen peroxide from breathing it, and so forth, that it would be a deleterious substance. I certainly should not want to take the nitrous acid into my system if I could prevent it. The fats are of far more nutritive value than the palmitic, oleic and stearic acids, so that I think any amount of decomposition would be deleterious.
  - Q. So, then, it has the effect of changing this to acids?

A. Yes.

Q. Of the kind that you describe. Now, what effect has the

bleaching upon the gluten of the flour?

A. The nitric acid decomposes gluten into simpler constituents which are generally known among chemists as amino compounds in general, which decompose, forming acids, for instance, I have some experiments on that if you wish to see—

Q. Now, which acid decomposes the groups in the gluten?

A. Nitric acid will decompose them, nitrous acid will decompose them, and the nitrogen peroxide will act upon them, change them into other substances.

Q. Now you may describe that.

A. To see whether or not nitric acid will decompose dried flour, that is, flour containing nitric acid, just as a sample of bleached flour contains nitric acid, I made such a sample by

spraying a very small amount of nitric acid into some 1096 dried flour. I want your Honor's attention so that you

can see that. I took a sample of dried unbleached flour, and, as I say, sprayed the nitric acid into that in the concentration represented by hundred cubic centimeters of nitrogen peroxide per kilogram of flour; that flour was bleached at once; I have the two samples here, Mr. Butler.

Q. Yes, we will mark them. A. All right, sir.

Q. Give me the unbleached first, the one that you did not treat?

(The specimens referred to by the witness were respectively marked "Government's Exhibit 45" and "Government's Exhibit 46".)

A. I was not quite finished, if you please, Mr. Butler.

Q. Exhibit 45 and Exhibit 46 are the specimens of flour to which you were referring when I interrupted you for the purpose of marking the exhibits. Now, hereafter please refer to that by exhibit number, and state what Exhibit 45 is, whether the bleached or unbleached?

A. The Exhibit 45 is the unbleached flour.

Q. That has been treated by nitric acid? A. No.

Q. Now, what is 46?

A. I had not quite finished. As I started to say-

Q. Go on.

- A. I treated flour not only with one hundred cubic centimeters or with nitric acid corresponding-to hundred cubic centimeters of nitrogen peroxide per kilogram of flour, but I treated it with a very much smaller amount, namely, 33 cubic centimeters of nitrogen peroxide per kilogram of flour, expressed of course as I say here, in nitric acid, that is, I put nitric acid in here corresponding to 33 cubic centimeters of nitrogen peroxide per kilogram of flour. The flour was bleached by this smaller amount of nitric acid as well as the larger amount.
- Q. Now, Exhibit 45 shows the flour before the treatment by the nitric acid? A. It does.

Q. And Exhibit 46 shows it after? A. It does.

Q. The treatment by nitric acid and in those particular specimens that you have there, the mount of nitric acid was one hundred cubic centimeters NO2 per kilo?

A. In this sample it is 33.

1097 Q. It is 33 in that sample? A. Yes, sir.

Q. The lesser amount.

Mr. Butler: Exhibit 45 and Exhibit 46 are offered in evidence.

Mr. Smith: No objection.

Q. Now how did you demonstrate, if you did demonstrate,

that the chemical action took place.

A. In the experiment with the nitric acid corresponding to 100 cubic centimeters of nitrogen peroxide per kilogram of flour, the temperature rose four and one-half degrees Fahrenheit. This is proof of the chemical reaction. In general chemical reactions are associated with the formation of heat. The nitric acid combined partly with the flour and partly acted upon the flour. I was able to prove that by treating this sample of flour with water to extract any free nitric acid in there. The free nitric acid would dissolve at once in the water. When I analyzed that solution the results show that 40 per cent of this nitric acid had acted upon or combined with, the flour.

Q. How did you get at that?

A. It is necessary only to titrate the nitric acid with a standard solution of alkali. The alkali corresponds per cubic centimeter to so much nitric acid. It is a simple mathematical calculation then, to determine how much nitric acid you had in there. I might say that in the dry flour itself very much more than this 40 per cent of the nitric acid was combined with the flour because the addition of water caused the nitric acid not to combine with the flour so much.

Q. What was the character of the product of the chemical

action?

A. There are, in the first place, acids formed by the action of this nitric acid on the flour. It generates more acids, for instance 36½ grams of this flour generated in two days acid equal to .073 cubic centimeters of 0.2 normal sodium hydroxid.

Q. Well, aside from the production of acids anything else?

A. There are nitrogen peroxide fumes, the gas, the nitro-

gen peroxide is formed.

Q. That is the same gas that the Alsop bleacher has?
A. It is.

1098 A. It is. Q. What else, if anything?

A. I believe that those are the end of the experiments that I have at that point.

2. Now, what further effect, if any, have you observed upon

the flour or any of its ingredients of nitric acid?

A. The nitric acid in combination with the nitrous acid brings about some further decompositions of the proteid constituents. We have shown that the nitric acid decomposes part of the flour and forms more acids. These acids are as we have shown, partly so-called amino acids; they are derivative of nitrogen. Now, when these acids are formed the nitrous acid acts upon this and decomposes this further. I have experiments on that. Do you wish them?

Q. Yes, sir.

A. I decomposed to some extent some flour with some nitric acid and I then added some nitrous acid to see whether or not the nitrous acid would act upon these amino compounds, the nitrous acid, as we have shown, decomposed the dried flour just exactly as we have it taking place in these samples. I proved that the nitrous acid does act upon these constituents and if, of course, decomposed in that action. Then I added the .0085 milligrams of N2O3, that is nitrous acid expressed as N2O3; in a very few minutes I analyzed the solution, and I found that only the .0011 milligram of N2O3 was left; that means that 7/8th, or say roughly 85 per cent of that nitrous acid present there as you can see in very small quantity, had been decomposed, and it decomposed the corresponding amount of these other products.

Q. What did they produce?

A. They produced first nitroso compounds, next diazo compounds, and finally hydroxy acids when they act upon the amino acids.

Q. Nitroso compounds, diazo compounds and what else?

A. And hydroxy acids.

Q. What are the characteristics of these compounds of acids? A. Nitroso, you mean nitroso compounds?

Q. Yes.

A. Nitroso compounds are in general, that is, the nitroso compounds of these derivatives I am speaking of, are in general very unstable substances, they decompose of

themselves, they would in some cases yield oxides of nitrogen, also nitrogen in some cases, and they could act upon other substances around them decomposing those. The nitroso compounds that I have worked with are analogous ones, if I may give those. Those are poisonous substances; they often affect the skin, if they get on the skin they raise blisters; if you breathe these compounds, if they happen to be volatile, and you breathe them two or three days your lungs will be sore and one becomes nauseated. I might say that we have worked with these compounds, analogous to the ones that I am speaking of here, in my laboratory, and not only have we observed ill effects like that, but other people working with them and describing them in literature have also warned others against the ill effects of these nitroso compounds.

Q. Now, in the bleaching of flour by means of this Alsop process, can you tell us whether or not, in your opinion, these nitrous compounds are produced in the flour as a result of the

bleaching?

A. I should say, that they most certainly are; it would be practically impossible to keep from forming them. It is a general truth in chemistry that if you bring together two kinds of compounds which react with each other, under any circumstances they are going to react. All we can do is to bring them together, and then the laws of chemistry make the rest follow. You can not keep them from doing that if you bring them together.

Q. And also as to whether or not this bleaching process results in the production of diazo compounds and hydroxy acids that you have spoken of? A. I say, beyond any question.

Q. Now, can you describe the characteristics as to injuri-

ousness or poisonousness of diazo compounds?

A. I have worked with some of those and the substances are harmful in their action on human beings. Some of our men are working with these diazo compounds; they have been made

sick in handling them, have to quit work for two or three days, and other people in working on these have noticed the same thing; others have warned fellow chemists against breathing them and allowing them to act upon them.

O. Now how long does the chemical action of the bleaching medium continue to go on in bleached flour bleached by the Alsop process?

A. It would continue to go on as long as you have any of this nitrogen peroxide or any of this nitrous acid or nitric

acid in the flour, and as long as that-

Will it go on as long as the flour continues to show the

nitrite test on the application of the Griess re-agent?

A. It would, it would act upon it as long as there is any of that gas and as long as there is any acid substance-any of the substances there.

Q. Can you [complain] to us so we may understand it, how that may be, how this flour, for example, is still undergoing chemical changes as the result of the Alsop process?

A. The nitrogen peroxide is in there partly as a gas; I have myself proven that by getting the gas out of the bleached flour. If I may use the board I can illustrate how that is done.

You say NO2, the gas, the very bleaching gas itself is

still in this flour that was seized? A. It is.

Well, how do you know that? How do you know it is there as a gas, is what I am trying to get at? You want a piece of chalk? A. Yes.

Well, take this big pad and a heavy pencil, perhaps you can do that, hold it up in your hand; can't you hold it up?

A. Yes, sir, I will draw it first, then I will. We have a well known method of determining whether or not there is a gas in a solid or a liquid, which gas can escape; or whether the gas is mixed in the air with the solid itself, or in a liquid, so it can escape. All we have to do is to put that substance, say the flour, into a glass vessel which has a cover fitting tightly, and then put above that, on a tripod, a vessel containing a substance like sodium hydroxid solution, or solid sodium hydroxid itself, which can take up all gases which would come

away from this flour. Now, if there is any gas mixed in with the particles of the flour that gas will gradually 1101

diffuse into this space and be dissolved in this alkaline liquid, and it is absolutely impossible for any of the flour or any particles to get up in there. The flour does not rise, of course, but if this gas is going to diffuse out through the solids. or the liquids, and through the air, and be dissolved in this alkaline liquid, you can afterwards examine that liquid to see whether or not the gas nitrogen peroxide, has been in the flour. Now, I have tested various samples of flour that are bleached. or have been bleached, and I have proved that they have always contained nitrogen peroxide gas as such in the flour, and in the air mixed with the flour. A little of the gas gradually diffuses out and gets into this liquid when you arrange the experiment in this way; I might say that this is a well known method of determining such questions, or whether there is any such gas.

Q. Now, assuming the chemical changes which you have described, this decomposition, when does it commence to take

place after the bleaching?

A. It would begin to take place the moment the gas is introduced into the flour.

Q. And continue as long as it remains there?

A. It would.

Q. What effect would the flour to make dough, the making of bread and the application of heat have upon these chemical

changes?

A. When you add water to the flour the nitrogen peroxide combines partly with that water; it has already combined partly with the water in the flour; you have then nitrous and nitric acids in that water, and I have shown myself that the nitric acid, for instance begins at once to decompose some constituents of the flour; all we have to do is to mix the water with the bleached flour and form a mixture and the reactions begin.

O. Now, as to the application of heat?

A. It is generally well known is chemistry and it is one of the fundamental laws, that in general the higher the temperature the faster reactions take place. And they take place, roughly, twice as rapidly for each rise of ten degrees in tem-

perature. I made a little calculation to see, roughly, bow many times as rapidly this reaction will take place.

For instance the reaction of nitric acid will take place faster at a higher temperature. If you were to bake bread at 200 degrees centigrade the nitric acid would react approximately two hundred and fifty thousand times as rapidly as it would at the ordinary temperature that we have around. So that rapidity of that reaction may sound astounding, but it is well known; we have all worked out so many similar reactions that there can be hardly any question.

O. Now, as to the amount of chemical change from a relatively minute quantity of these acids, nitric and nitrous acid. I want to get at it, do those acids combine directly and just once, and is that the end of the job, or is there a chemical process by which they continue to act during a relatively long period of time, while the nitrogen peroxide gas remains in the

flour?

A. The action goes on continually. When the nitric acid and the nitrous acid are formed their action does not stop there. Now, as I have said, the nitric acid begins to form nitrogen peroxide that in turns re-acts with water again,

forms more nitric acid, and then again. Furthermore, I might say that we have carried out some experiments to prove our reactions must be very similar; they may be going around in a circle, as you might say, the nitric acid first acts upon, for instance, the gluten, and forms this gas; then that in turn acts upon the water and forms more nitric acid, and so it goes around. And there is another phase about that: the nitric acid may act upon certain constituents there and form compounds, which in turn can act upon the gluten and form much more nitrogen peroxide than corresponded to the amount present originally.

Q. What substance does that?

A. Well, for instance, nitro-starch sets upon flour and forms a great many times as much nitrogen peroxide as could

possibly come from the nitro starch itself.

Q. Does this nitrogen peroxide which is the result of decomposition in the flour, continue to work as the nitrogen peroxide which was made by Alsop's machine and put into the flour? A. Would it act as such?

1103 Q. Yes, well, I don't care whether as such, whether di-

rectly or indirectly?

Yes, sir, that gas would keep on acting in the way I have described here, first would act upon the water, the nitric acid there would act upon other constituents and form more nitrogen peroxide, and so that would go on around. I could show it on bread there. As I said, some of these constituents form and act upon the proteids, for instance, of the flour, and form more nitrogen peroxide than corresponds to the amount that you take at first. Now, that is for this reason. proteids contain nitrogen, and we have the air, and the air and the nitrogen of the proteids are both involved in these reactions, so that in these reactions we really make the air itself, oxidize the nitrogen of these proteids; the result is that we have more and more of this formed. Of course, these reactions are also complicated with others, and one other that I should like to speak of is this: the nitrous acid itself removes certain ones of those things formed, otherwise the reaction would go on for an indefinite number of times.

Q. What effects do the reactions produced by the Alsop process of bleaching have upon the protein and other valuable

food ingredients of the flour or constituents of it?

A. They decompose these proteids fairly rapidly. I have an experiment here which will show that the nitrogen peroxide and the nitric acid and the nitrous acid all combined will tend to decompose these proteids, and I can give one experiment if you wish.

Q. Yes, sir.

A. I mean of nitric acid. I should like to recall the fact that in one experiment we added a small amount of nitric acid corresponding to one hundred cubic centimeters of nitrogen peroxide per kilogram of flour. Now, this mixture was perfectly dry, just looked like an ordinary bleached flour; that was allowed to stand in one of the glass apparatus, this one that I described, and we determined whether or not any nitrogen peroxide, for instance, were formed in that experiment. The liquid above, in this place, collected nitrite, I might say, nitrite reacting material corresponding to .032 cubic centi-

meters of nitrogen peroxide as N2O4. 361/2 grams of this flour was used. Now, this reaction, of course, does not stop there; the nitrogen peroxide, as I have said, acts in turn upon the water and forms more nitric acid, and then would begin to go all over again. That principle is called in chemistry catalytic reaction, or the process is called catalysis. We mean by that this: That the substance can, in many cases, decompose much more of the substance than corresponds to this amount, I should like to recall one experiment, which is well known in chemistry, in which, for instance, Thompson and O'Sullivan show that one part of diastase acid can decompose one hundred thousand parts of cane sugar and still be just as active as it was originally, ready to decompose many more times than one hundred thousand parts of sugar. Now, it is a well known fact, one which a number of us interested in catalysis have proven in other cases, and that is why I say the action of the nitrogen peroxide or of the nitric acid does not stop when you bring that into the flour.

(Recess until 2 o'clock p. m.)

Tuesday Afternoon, June 14, 1910.

Pursuant to adjournment, Court met at two o'clock p. m., Tuesday, June 14, 1910, and proceeded with the trial of said cause further as follows:

Mr. Butler: The gentlemen on the other side have consented that I may call Dr. Stengel at this point.

The Court: Very well.

Alfred Stengel, called as a witness on behalf of the government, being first duly sworn, was examined by Mr. 1105 Butler, and testified as follows:

### Direct Examination.

Q. Alfred Stengel? A. That's right.

Q. Where do you live, Mr. Stengel? A. Philadelphia.

Q. And what is your profession?

A. I am a physician.

Q. I would like to have you state to the court and jury, fully, your education, special training along particular lines, and professional experience, and work, so as to indicate your qualifications as a witness, touching the technical matters

about which I will ask you, later on.

A. I am a medical graduate of the University of Pennsylvania, graduating in 1889. Thereafter, I have been connected with various hospitals of Philadelphia, in capacities of pathologist and physician. For several years I was pathologist to the German Hospital, and the Philadelphia Hospital, and since that time, practically the last fifteen or more years, I have been physician to several of the hospitals, there, including the Howard Hospital, the Philadelphia Hospital, the Pennsylvania Hospital, the Children's Hospital, the University Hospital, and I am now connected with the Pennsylvania, Philadelphia, and University Hospitals as physician. my time very largely, in the earlier years to the study of pathology, and published a text book on that subject. I have, since 1898, been Professor of Clinical Medicine in the University of Pennsylvania, and was, for a time, connected, also, in a similar capacity, with another medical school, the Women's I have contributed articles on pathological Medical College. subjects, in recent years, more particularly on medical subjects. I have contributed, specifically, to Keating's Encyclopedia of the Diseases of Children; Osler's Encyclopedia of Medicine, and was the general editor of the Millenockle's Encyclopedia of Medicine, which was translated from the German, and published in English. For a time, I was the editor of the

American Journal, of the Medical Sciences, and I have been connected with various medical associations, including the Association of American Physicians, the American Medical Association, the Society of Pathologists, and Bacteriologists, and a number of other more local medical

organizations.

Q. And you are engaged in the practice of your profession generally, in Philadelphia? A. I am.

Q. And also engaged in teaching there?

A. I am still Professor of Clinical Medicine, in the University of Pennsylvania, and engaged in private practice, there.

Q. Doctor, this is a case of the government against a shipment of flour, seized on the charge that it was adulterated, and, for the purposes of your opinion, you may assume that the flour seized was treated by a process known as the Alsop process, which generated nitrogen peroxide gas, and, after the same was mixed with air, it was brought into intimate contact with the flour, in a state of agitation, sufficiently to substantially bleach and whiten the flour, and that, by the process, the flour was so affected that it gives reaction for nitrite reacting material, upon its being tested by means of the Griess-Illosvay test. I want to ask you whether or not such treatment, in your opinion, added a substance or substances to the flour? A. It would.

Q. And, the character of such substances.
 A. It would add nitrous and nitric acids.

Q. And the effect of each, as to whether it is poisonous, or deleterious, or both.

A. Both are poisonous and deleterous substances.

Q. You may further assume that bread and other food made from this flour will contain nitrite reacting material, which will be disclosed by applications of the Griess-Illosvay test, and I want, upon that state of facts, to have your opinion as to whether or not such food would be injurious to health.

A. I think it would.

1107 Q. Will you give us the reasons, or consideration upon which that opinion is based?

A. My reasons would be that the addition to flour of nitrite reacting substances, and the poisons of those nitrite reacting substances still in the bread made from that flour, and these substances being poisonous and deleterous, the bread resulting from the making from that flour would be injurious to health.

Q. Now, as respects the degree of injury resulting from the use of the flour, or of the bread, containing this nitrite reacting material, or the degree of injuriousness of such

food, upon what would that depend, please?

A. That would, of course, depend upon the quantity of the nitrite reacting substances. If present in very large quantity, the flour, or bread, would be decidedly injurious. If present in very small quantity, it might require a longer time to manifest any injurious effects, and these injurious effects might, of course, not be very obvious immediately after, or, even, some time after consuming such material.

Q. Now, how does the injury take place, upon the consumption of bread containing such nitrite reacting material? What physiological action, or chemical change is worked in the

body?

A. Well, we know that nitrites have a certain effect upon the body, that are harmful. In the first place, the nitrites have a decidedly injurious effect on the blood, so altering the blood that it becomes incapable, to the extent to which it is altered, of carrying on its proper functions. If a very over-whelming dose of nitrites were taken, the change of the blood, together with other changes, that I shall mention, might be rapidly destructive of life. In very small quantity, then, the effect would, of course, be proportionally less. This change in the blood is a well known one, which consists in so altering the coloring matter of the blood—the hemoglobin, as it is called—that it is not any longer capable of carrying oxygen—that is, carrying on the important function of the blood,

which enables us to breath in air, and exhale carbonic acid gas, and go on living. That is the first, and per-

haps most important effect of nitrites. A second effect, of importance, is that on the circulation of the blood. Nitrites, all of them, are powerful depressants to the circulation, and lower blood pressure and injure health by interfering with proper circulation of the blood. A third effect of nitrites is one which is exercised on muscular tissues, the walls of blood vessels, the walls of the heart, muscular tissues generally, are destructively affected by nitrite poisoning. Fourth, the effect of nitrites upon digestion is injurious, in the possibility of irritating the stomach and intestinal tract, and interfering with digestive processes. Now, these are the four ways which nitrites, in quanitites sufficient to make their effects manifest, influence the body to the disadvantage of health. If the quantity of nitrites be reduced to a minimum, so small a quantity as even beyond the reach of chemical detection, the effect would be correspondingly diminished. The effects, however, of nitrites, in any quantity, I believe are in the same direction. and deleterious.

Q. What, as respects health, is the necessary or inevitable tendency of eating of bread containing this nitrite reacting

material, made from this seized flour.

A. The effect would be to the detriment of health.

Q. Now, I am not sure that I caught, as you stated, the four considerations upon which that opinion rests. One is the change of the hemoglobin of the blood to met hemoglobin, destroying the oxygen-carrying power of the hemoglobin, and, two, is the tendency to depress blood pressure.

A. To depress the circulation generally. Q. And, three, impairs digestibility?

A. Three, I said was the effect upon muscular tissues. Q. How does the effect upon muscular tissue occur?

A. By direct action. I wish to add that, possibly, also, by the interference with oxidation that occurs, because the hemoglobin of the blood has been converted into met-hemo-

globin, which is not able to carry oxygen, and, that is 1109 usable oxygen, and consequently the muscular tissues are deprived of oxygen, and undergo degenerative changes.

Q. Now, if it be assumed that nitrites, or nitrite reacting material, of substantially the same sort as found in this flour

and the bread made from it, be contained, we will say, in the atmosphere, and in vegetable food of plants; in the saliva of human beings, in greater or less quantities, as compared with the amount found in the bread made from this bleached flour, would that, in any degree, change your conclusions as to the effects of the use of the bread containing the nitrite reacting material? A. Not in the least.

Q. Does the human system develop any means of defense or toleration against these nitrites, or this nitrite reacting material, by reason of customary use, or anything of that kind?

A. It does not. It has no defense against this particular

kind of poison.

Q. Now, to make that perfectly clear, are there some substances that the human system does have means to defend against, and for which it acquires a kind of toleration?

A. Yes. There are certain substances for which the human body has means of defense, by which these poisons are neutralized to a certain extent, and, sometimes, completely, within the body. Those are well known detoxicating mechanisms, or processes, as they are called—that is, detoxicating, because these processes destroy the poison. Certain substances which the body is in the habit of receiving, perhaps or, frequently received, are thus neutralized. In the case of nitrites, there is no process of that kind. It is true that, if nitrites, taken as nitrous acid, were combined with some basic substance, a soda, for example, and a nitrite of soda were made, that there would be a poison produced which, weight for weight, would be a little less destructive than the first one, but there is—

Q. (Interrupting) But it would be, on account of the addi-

tion of the sodium to the molecule?

1110 A. Because of the addition to the sodium. But, there is no defensive mechanism to detoxicate nitrites.

Q. Then, are the nitrites which are found in the air, and in vegetables, if they are found, and smoked meats, if they are so found, and in the saliva, if they are so found, injurious to

health too?

A. They are poisonous, and, ingested into the stomach, would have the same effect that nitrites in bread would have. The only difference that is to be made is that, so far as the atmospheric air is concerned, of course, that is taken mainly into the lungs, breathed in. Some of it might, of course, be swallowed because the air, coming in contact with the moisture of the nose and throat, would become mixed with that, and might be swallowed; but being taken into the lungs, absorption of nitrogen oxide, that way, would not be so likely to occur, as from the smoke.

Q. Now, if it be assumed that the effect of eating this bleached flour bread may not be observable by the most skill-

ful diagnostician, as manifesting itself by symptoms, or illness, or anything of that sort, would that, in any degree, whatever, tend to change your views, or negative the conclusion which you have given us, to the effect that nitrite reacting material in this bread, made from this flour, is injurious to health?

A. It would not alter my view, for this reason, that, if quantities of nitrites, infinitesimally small, are taken into the body, it is not to be expected that the effects of those are going to be manifest, like the effects of large quantities just the same as a person, for example, who lives in a room which is covered with green wall paper, containing arsenic, might not show any immediate effects of the arsenic poison, but, after a long period of time, might grow unaccountably ill, and the effects be produced by the daily inhalation of a little arsenic. Just so, in the case of nitrites.

Q. You may tell us, whether or not it is generally true that the use of food adulterated by the addition of minute quantities of poisonous or deleterious substances, shows, by

1111 symptoms, or immediate change in apparent well-being, the fact that the food is adulterated and injurious.

A. No. Read the first part of that?

(Question read by the reporter).

A. No. If minute quantities of poisons were added to food, the effects of those poisons might not be at all manifest, immediately after eating that food, or even after some repetitions of the eating of that food.

Q. Well, in the case of these nitrites in the bread, is it known, with certainty, that injurious effects follow the eating

of the bread?

A. Because the nitrite bodies are poisonous, they have an effect upon the system which is certain. There is no mechanism by which that effect can be obviated. Therefore, the effects are certain to occur. If they are in such small quantities each time, that you cannot see the effects of summation, the addition of one dose after the other, easily conceivable, brings about deleterious effects. For example, when nitrites are permitted to gain access to the circulation, they inevitably destroy a certain quantity of hemoglobin. That is, a chemical reaction, as sure as the chemical reactions, that are performed in test tubes, by the chemists. That hemoglobin is destroyed. body has to make that up, and if you give a big enough dose, at one time, the body will not be able to diet it. If you would give smaller doses, the body may be able to make it up, but there is a limit, beyond which the capacity of repairing, daily, small damages, cannot go.

Q. Now, if it be assumed that the injurious effects of bleached flour bread cannot be proved by experiments, does

that fact tend to prove that no injurious effects do result from

eating of such bleached flour bread?

A. No, it does not. That would not disprove the fact, for this reason—to prove that infinitesimally small quantities of a poison taken daily are damaging, in the long run, is an experiment, the difficulties of which must be very apparent.

may take a long time. It may take years, to bring about In the meantime, it is impossible to conduct

an experiment, and keep a human being, or an animal, for that matter, under certain conditions, to prevent outside injuries, long enough to prove it. Therefore, in my opinion, it would be practically impossible to prove directly, by experiments, that, in very minute quantities, this poison, or other poisions, are capable, in the end, of bringing about certain deleterious results, but, in the meantime, if the same effects are producible from small, as from large doses, of a poison, the conclusion is undoubted that the effect is a deleterious one.

Q. Now, you may tell us whether or not it is generally recognized in your profession that poisonous substances taken with food are injurious to health, even in the absence of experimental proof that the very poisonous substances, or any specific instances produce poisonous results, or results injurious

to health.

The fact that a substance is a poison, and has certain definitely known poisonous, injurious effects, is, of itself, sufficient to bar that substance from the daily use as a food, or the frequent use, in any way, even in small quantities, unless it be known that there are defensive mechanisms, or ways that the body has of protecting itself against small quantities.

Mr. Butler: I think that will be all.

### Cross-Examination

By Mr. Smith:

Q. Doctor, I believe you are a practicing physician in Philadelphia. A. I am.

And have been for many years?

Since 1889, twenty-one years. A.

Do you make a specialty of any particular diseases? Q. No. I am a specialist, if you could call it so, in internal

medicine. Well, you have made somewhat of a specialty of the

study of diseases of the stomach, haven't you? 1113

I have, in as far as that is a part of internal medi-

cine, yes.

That would include the study of the stomach, and its condition, from the standpoint of its ability to digest food, and its general condition, would it not? A. Yes.

Q. That brings you somewhat closely in touch with the subject of foods? A. Somewhat, yes.

Q. And, what particular articles of food are injurious, and

what are not? A. Yes.

Q. And, in dealing with your patients, you have had to consider the question as to whether certain conditions have been brought about by the foods that they eat? A. Yes.

Q. Now, when you speak of a deleterious food product,

what do you mean by that?

A. A deleterious food product would be a food product capable of damaging health of the individual.

Q. One which would lead to a diseased or disordered condition of the stomach? A. Yes.

Q. And, when you speak of poisons, what do you mean?

A. I mean one in which damage was done to the individual, by some substance which could be designated as a poison.

Q. Where damage had been done by reason of some sub-

stance taken into the system? A. Yes.

Q. Now, is it true, or not, that in medicine we find a good many substances which, if taken in sufficient concentration, and sufficient amounts, may produce injury, but, if taken in more diluted form, or, in much less quantity, or concentration, produce either negative results, or beneficial results? Is that true, or not? A. That is true, yes.

Q. Then, there are many substances which, if you took it in sufficient concentration, sufficient amounts, would produce injury, but, if you take it in diluted form, such less amounts

may produce beneficial results?

A. Well, I did not say "many", and I do not say "few".

1114 Q. Well, "some", without playing on the word "many", or "few". A. Yes.

Q. There are some? A. Yes.

Q. Take, for instance, benzoic acid. If I take a sufficient quantity of that, it will kill me, won't it?

A. Yes, I suppose it would.

Q. It would be denominated a poison, wouldn't it?

A. Yes.

Q. And yet, benzoic acid is a natural constituent of cranberries, is it not? A. I believe so.

Q. You would not condemn the eating of cranberries, simply because they contain some benzoic acid, would you?

A. No.

Q. But, as you say, if I would take a sufficient amount of benzoic acid, at a time, it would kill me?

A. If you took enough.

Q. But, as I get it in the form of food, cranberries, it is in such diluted form, and small amount, that, instead of it being injurious, it is really beneficial, isn't it? A. Well, I do not know about that.

Q. Well, you would not say it is injurious for me to eat

cranberries? A. Well, I did not say that.

Q. Now, acetic acid. If I would take that in sufficient amount, sufficiently concentrated form, that would kill me?

A. Yes.

Q. And would be regarded as a poison? A. It would.

Q. And yet, acetic acid is a natural constituent of pure apple cider, isn't it? A. Yes.

Q. Well, you would not condemn the apple cider just be-

cause it contains some acetic acid, would you?

A. Not unless it contained too much.

Q. Contained in lesser amount, apple cider is all right, isn't it? A. Yes.

1115 Q. And the acetic acid comes under the definition of a poison, as you gave it, doesn't it?

A. Yes. I think you could call it a poison.

Q. Now, if I take a sufficient amount of hydrochloric acid, into my stomach, it will kill me, won't it? A. Yes.

Q. It is a very poisonous substance, isn't it? A. Yes.

Q. And, yet the stomach secretes hydrochloric acid every day, doesn't it? A. Yes.

Q. And if I took in one dose the amount which the stomach would secrete in a day, if I took it all at once, it would kill

me? A. I would have to stop to calculate that.

Q. Well, if I took in one dose, the amount of hydrochloric acid which the stomach would secrete in three or four days, it would kill me, wouldn't it?

A. Some number of days, yes.

Q. But as a matter of fact, the stomach is secreting the hydrochloric acid all the time, isn't it? A. Yes.

Q. And it is an essential? A. Absolutely. Q. In the human economy, isn't it? A. Yes.

Q. So, there are a good many things, that way—there are a number of things which, if I took it as a dose, and in concentrated form, it would produce great injury, but, if taken in diluted form, it is beneficial, isn't it?

A. Some of them, yes.

Q. Now, it has been referred to here, a number of times, —nicotine. If I took that, in concentrated form, it would kill me, wouldn't it? A. Yes.

Q. And I would not have to take very much of it, either,

would I? A. Not very much.

Q. And yet, you do not say that the nicotine which I take when I smoke a cigar, is producing any injurious results, do you? A. I think it is.

Q. You think so? A. Yes.

Q. You think that, when I take tobacco in any form, that I am introducing into my system a poisonous substance, which is injurious to my health? A. Yes, I think so.

Q. Irrespective of the amount?
Well, yes, irrespective of the amount. It is a harmful

substance, always.

Q. Of course, it could be so minute, I suppose, that you could not tell you got any, at all, but, as I understand it, your view is, that, by the taking of tobacco in any form, you introduce into the system a certain amount of nicotine, which you say is injurious to health? A. Yes.

Q. And you reach that conclusion, because you say that if I take enough nicotine it will kill me, therefore, if I smoke a cigar, it is shortening my life, and injuring my

health?

A. Not exactly. You misunderstood me. The difference between nicotine, and hydrochloric acid, or benzoic acid, for example is, that there is no way that the body has of defending itself against nicotine poison, and there is a way that the body has of defending itself against a reasonable quantity of benzoic acid, and hydrochloric acid.

Q. But nature has no way of defending herself against

nicotine? A. No way, at all.

Q. Then, it must be that, no matter how small the nicotine I take, when I smoke a cigar, or otherwise, it is injuring my health to that extent? A. To that extent.

Q. And, by parity of reasoning, you would claim that, no matter how small the nitrites I take in my system, it is injur-

ious to some extent? A. It is injurious to health.

Q. You reason the nitrites the same as you reason the nicotine. Nature has no defense against either one? A. No.

Q. Then, how do you account for the fact that many people who are such constant users of tobacco, live to such a ripe old age? Do you think their age has been shortened by the use of the tobacco?

A. I am not sure about that. That is where the difficulty comes, of trying to perform an experiment upon

one human being, with minute quantities.

Q. Well, let us take your judgment. Now, as a doctor who has given this matter considerable study, I think, do you say that the lives of individuals who use tobacco, and use it constantly that their lives, and their health is impaired, and shortened, by reason of that?

A. I did not say impaired and shortened. I did not say anything about life. I said deleterious effects upon the body. You might go on and live just as many years, but you might

go on living in an impaired state of health.

Q. But you think that the use of tobacco by those old people, that it has been injurious to their health?

A. You mean, old people who have taken it regularly?

Q. Yes, sir, I mean those people who have used tobacco all their life. Do you think that has injured their health?

A. I think so, to some extent.

Q. And it is on the same parity of reasoning, you say, that taking anything into the system which contains nitrites, impairs the health, to that extent? A. No.

Q. Well, I thought you said nicotine taken into the system

that nature had no way to defend against it.

A. Oh, you are speaking now, particularly of nicotine? Nicotine and nitrites, I would reason about those poisons, in the same way.

Q. You know, as a matter of fact, that nitrites are present,

in more or less degree, in the air we breathe, don't you?

A. Yes.

Q. And, of course, by inhaling it in the lungs, I have got to take in some amount of that, haven't I?

A. Yes, with this explanation, that I made in answer to the question asked me by the attorney on the other side, that, in-

haling nitrites into the lungs, they are not absorbed in 1118 anything like the quantity that the same amount of nitrites, swallowed into the stomach, would be absorbed.

Q. It would reach the circulation sooner, would it not?

A. No.

Q. If I inhale it, in the form of atmosphere, doesn't it reach the circulation sooner than if I take it into my stomach?

A. If it gets in.

Q. Well, let us take something that goes by way of the stomach. Now, you know specifically, do you not, that that is present practically all the time, in all people, in the human saliva?

A. That has been denied by some people, and asserted by

some others.

Q. Now, I am not discussing the question as to whether it is a constituent element of normal saliva, as it comes from the glands, but as it is swallowed into the stomach.

A. Yes, I have heard that denied.

Q. Well, it has not been denied, here. What is your judgment, as a physician?

A. I do not believe that nitrites are in a normal secretion

of the saliva.

Q. No, that is not my question, at all. It may have been placed there, by reason of the bacterial action in the mouth?

A. Yes.

Q. But, as it is swallowed into the stomach, and reaches the stomach, what is your judgment, as a physician, as to whether the saliva does contain it?

A. I have no doubt that we often swallow nitrites.

What would you say, as to the rule?

Q. Well, I suppose it is very often. I will not say in-A. variably, and I will not say it is not.

Now, you say nature has no defense against that? O.

No. sir. A.

None at all? Well, if nature has provided no defense O. against this, wouldn't it be reasonable to conclude that nature intended that I should take that into my 1119 system?

I don't think nature intended us to have bad teeth, and yet, that is the principal cause of nitrogenous or nitrifying

bacteria having the effect in the mouth.

Q. But, let us take the little child, that has not got any teeth. Let us take the infant child, which hasn't got any teeth. Doesn't its saliva contain nitrites, as it goes into the stomach?

A. Yes. A little child's mouth is so dirty, it has to be cleaned out by boracic acid, by the nurse, every time it is

nursed, to keep it from infecting the nurse's nipple.

Well, take a child raised in the home, where the best sanitary conditions are observed, and a child that nurses at its mother's breast, it would still have these nitrites in its saliva, when it swallowed, wouldn't it?

The nitrifying bacteria? Yes, I suppose, on occasions,

it would.

Now, you say that nature, in that infant child, has provided no defense against these nitrites? A.

Q. Nature, you think, overlooked that?

No. I don't think so. A.

Now, from the fact that the nitrites would be practically always present in the stomach, in the infant child, and that nature has provided no defense against it, isn't it reasonable to conclude that nature intended that that would go into the stomach?

No. I do not think that is a fair conclusion. A.

Well, probably not. Now, in the study or practice of medicine, doctors aim to prevent, rather than, or as well as to cure, don't they? A. Yes.

Now, have you ever heard, in the medical profession, of doctors prescribing or advising any remedy, to prevent the effects of nitrites taken in the way of food?

I think not. . A.

- In all your practice, have you ever endeavored to overcome the effects of nitrites taken into the human 1120 system in the way of foods?
  - A. Not until recently.

Q. How recently?

Since I have known something about this subject.

Q. You made a deposition, in Philadelphia, last winter, on this question, didn't you? A. Yes.

Now, up to that time, anyhow-you had been practic-

ing medicine how many years? A. Twenty.

Q. Now, up to that time, had you ever, in your own practice prescribed or known of any other person prescribing remedies to overcome the effects of nitrites taken into the system in the way of food? A. Not to my knowledge.

Had the subject of the effects on the human system of nitrites taken into the stomach in the way of food, or carried into it in the way of saliva, ever been the subject of investigation on your part, or any other physician's that you know of?

Not on my part.

And yet, you had been treating and dealing with people who had diseases of the stomach, hadn't you? A. Yes.

And, up to that time, anyhow, after twenty years of practice, it had never occurred to you that of the diseases of the stomach might be due to nitrites taken into the system in the form of food products, or taken into the system in the way of saliva going into the stomach, had it?

A. No. I had no knowledge of it.

Now, you speak of these nitrites, as being a poison. Do you mean that, if taken into the stomach, it might produce what you call chronic, or acute poisoning?

Well, if nitrites are taken in large quantities, they will

produce acute poisoning.

Q. By acute poisoning, you mean where it happens speedily?

A.

And, by chronic, you mean where it would result from the long continued use?

A. Yes.

- Now, in your practice of your profession, have you 1121 even seen a person suffering from what you termed acute poisoning, which you diagnosed as brought about because of the presence of nitrites that had been taken into the system through the stomach?
  - A. Oh, yes. I have seen people poisoned with nitroglycerin.

Q. Well, I am not talking about nitroglycerin. You did not find any nitrogylcerin in this flour, did you?

A. I am answering your question. You said, something taken into the stomach.

Well, have you, in all your practice ever known of a person, or has there ever come under your personal observation, a person who was suffering from nitrite poisoning, such as you have described as would be in this flour, due to the presence of these nitrites in any food product that he had taken into his stomach?

A. No, I have never recognized any one suffering from any poisoning that I could attribute to nitrites. Now, may 1 go on and explain?

Q. Yes.

You have misquoted me, slightly. You are not quite A. quoting me correctly, in saying I testified to what kind of symptoms was produced by nitrites in this case.

Q. Well, I don't want to misstate you, or misquote you,

Doctor, in this way, the least bit.

A. In answering your question, as I understand it, I have never seen any one in whom I could recognize symptoms that

I could attribute to nitrite poisoning from food,

Q. And, has there ever been a case that has come under your personal observation, where a person eating food which contained nitrites such as you have testified about would be produced in this flour, has contracted nitrite poisoning, or whose health has been in any way impaired by it?

Not so far as I could recognize it.

Well, your conclusion that it might result in that result is, of course, derived wholly from a system of 1122 reasoning which you adopt, rather than from anything which has come under your personal observation?

A. Precisely.

Now, you, I think, referred to one of the effects of nitrites taken into the system, as acting on the blood, and changing the hemoglobin into met-hemoglobin. If nitrites, in a certain amount, were taken into the system, there would be produced met-hemoglobin, and some of this blood, is drawn from the person's veins, how could you ascertain, or demonstrate the fact that he had met-hemoglobin?

Met-hemoglobin, if in sufficient quantity, will make the blood a darker color, for one thing, and, for another thing-I will have to answer the question completely, and if the methemoglebin is not in sufficient quantity, it might be necessary chemically or spectroscopically, to determine the pres-

ence, there, of the met-hemoglobin.

Q. Well, if the blood were drawn from his veins, and he had taken a sufficient amount of nitrites to produce met-hemoglobin, would the spectroscope disclose the difference in the color?

The spectroscope would show certain lines, significant of met-hemoglobin.

Would it be observable in the blood pigment, or, by that, you mean the blood color, do you?

You do not see the color in the spectroscope. You see lines which indicate the pressure of a certain substance.

Well, what do I understand by "blood pigment"? Q.

The coloring matter of the blood.

Q. Would the coloring matter of the blood be affected, if

a person had met-hemoglobin?

A. The met-hemoglobin is one of the derivatives of the coloring matter of the blood. The coloring matter of the blood is hemoglobin. If certain poisonous substances act upon the blood, the hemoglobin is converted into met-hemoglobin, which

is a very slight modification, but a very significant one. Q. Well, what I am trying to get at is, whether or not you could discover the effects of this, by the color of

the blood. A. Yes.

Q. Then, if a person took into his system an amount of nitrites which would be injurious to health—took it in short doses, it would be discoverable in the color of the blood?

A. Yes.

Q. Now, how much nitrogen as nitrites do you say, as a physician, that an adult of thirty or forty years of age, in good health, would have to take into his system, within a period of twelve hours, in order that you might notice its presence in the color of the blood?

A. I do not think that can be answered. I don't think it

is known.

Q. Well, do you [that], no matter how large the quantity

taken, you would not be able to discover it?

A. Oh, if a very large quantity, or [ever] a reasonably large quantity is taken, the effect would show, but how small a quantity—

Q. (Interrupting) What would you regard as a reason-

ably large quantity?

A. That would depend on the individual. Some people are very quickly poisoned, by those poisons, and some not so readily.

Q. I am trying to get the range.

A. I don't know what the range of figures is. It has never been worked out, so far as I know, but all I can say is, that how small a quantity would make it a visible change, I cannot say. It would depend upon the size of the individual, the character of his blood, the quality of his blood, the rate of his absorption, and so forth.

Q. Let us assume, Doctor, that a person thirty to forty years of age, weighing one hundred forty pounds, and in good health, an average individual,—that is what I mean,—should take into his system, during a period of ten hours, about eight

or nine grains of nitrites as nitrogen, would that pro-

1124 duce met-hemoglobin in the blood?

A. It depends upon the kind of nitrites you put into him. Some, you would have a dead man on your hands.

Q. Well, suppose he took this in the way of sodium nitrite?

A. Sodium nitrite. He might possibly take that much and survive, and, in that case, I should certainly expect to find methemoglobin in his spectroscope.

Q. Well, how would the presence of it be noticeable on the

person who took it?

A. Oh, there would possibly be a cyanosis. That is to say, a blueness of the skin, and of the features. That would be the noticeable effect, externally.

Q. Well, let us draw some blood from that person. Then,

how would you see it there? A. It would be dark.

Q. There would be a difference in the color of the blood?

A. Yes.

Q. Blood pigment? A. Yes.

Q. And you think that amount of dose would have a very noticeable effect? A. That amount, I think, might kill.

Q. Now, I don't want to mislead you in this. I want to be perfectly fair with you, because I think you are with me. My question is now, if during a period of ten hours, covering a period of ten hours, a person thirty to forty years of age, and weighing, say, a hundred and forty pounds,—if he would take into his system eight or nine grains of sodium nitrite, do you say that the effect of it would be noticeable in the blood pigment, if some were drawn from his veins, say, within an hour, or two after the taking of the last dose?

A. Very probably. Not certainly, of course, for the reasons I gave a little while ago. Some individuals can stand an

enormous dose of poison.

Q. Do you think that person would suffer any injurious effects, and not show the effects at all, from the taking of it?

A. The exceptional person?

Q. No, average person? A. I think so.

Q. Very noticeable in the blood? A. Very probably.

Q. Now, Doctor, in the practice of your profession, have you ever seen a case where a person was suffering from met-hemoglobin due to the nitrites contained in any food he had taken into his stomach?

A. Not in any case where I could attribute it to food.

Q. So, your conclusion that a person eating this bread, which contains nitrites, might have the hemoglobin of his blood converted into met-hemoglobin is not based upon any actual observation, or actual knowledge that you have, but from your general knowledge, and your reasoning?

A. Yes, that cause must follow effect—or, effect must fol-

low cause.

Q. But the fact remains, that, in all your practice, you have never seen a person that was suffering from met-hemoglobin, which you diagnosed as due to nitrites contained in any food that he had taken into his stomach? A. No, sir.

Q. Did you ever find a person suffering from met-hemoglobin, where you diagnosed his case as due to anything he had caten?

A. Yes, if you call swallowing medicines eating, I have

seen that, yes.

- Q. Well, he had been "doped" with medicine, until he had it, but, have you ever seen a person that was suffering from met-hemoglobin, due from anything he had eaten as a food product? A. No.
  - Q. No matter whether it contained nitrites or not?

A. No. I have never seen that.

Q. Now, nitrites, Doctor, which are taken into the system in other food products, I assume would be just as injurious as when taken in the form of flour? You do not condemn that because flour is the carrying medium? A. Not at all.

Q. The effect would be just the same in the other, and, if nitrite is contained in ham, as Brother Butler suggested, that

would be just as injurious as that contained in bread?

A. I think so.

Q. And any other food product would be on the same plane?

A. On the same plane, yes.

1126 Q. So that, if I should abstain from the eating of bleached flour, because it contains nitrites, the same reasoning would cause me to abstain from the use of any other food product that contains it, wouldn't it?

A. Anything that contained nitrites.

## Redirect Examination

By Mr. Butler:

Q. Some of the questions asked by Mr. Smith suggest the propriety of asking you whether or not met-hemoglobin is a disease?

A. No, I tried to make that clear. Methemoglobin is a change of the blood in question, which occurs from nitrite poisoning, and it is not a disease. It is simply a manifestation of that poisoning.

Q. It is a change in the blood?A. It is a change in the blood.

O. And it is observable, when microscopically viewed?

A. Spectroscopically.

Q. And, is that an easy matter?

A. No, that is a matter of considerable expert ability.

Q. Requiring great skill in the observer?

A. Of course, if a person has an overwhelming dose of nitrite poison, as I said before, he may get blue in the face, and the blood drawn from a vein look dark, even, but, in order to determine the small quantities of met-hemoglobin in the blood, would require an expert hand with the spectroscope.

Q. Now, would the customary use of bleached flour bread, assuming it to be eaten as bread is usually eaten, over a long period of time, injuriously affect health, when there is no observable effect from it, immediately after eating it, for a considerable period of time?

A. The explanation I would make of that, seems to me a perfectly simple one. If a certain poison has the power, and, inevitably that power of attacking your blood and de-

stroying a certain amount of it, proportioned to the 1127 amount of poisoning you take into you, no matter how small a dose you take, every time you took that dose you would be doing that damage to your blood. Now, fortunately, we are so built that every time we do a little damage to us, we don't die right off, but the body has the power to make up for wear and tear, but it doesn't do to make that wear and tear come too often, and it doesn't do to increase and multiply the kinds of wear and tear that we expect the body to overcome, and therefore, if you take a poison, even in small quantities, it is capable of doing even a small damage to your blood, day in, and day out, and you do, in the long run, a great damage, to not only the blood, but to the parts of the body that restore the blood, because the blood has to be made by the organs, especially the bone marrow, and, after a while, you exhaust that capacity, and there is a great injury done, and the same thing applies to the slight effects of poisons upon other structures. Once, or twice or three times, you can transgress. I don't mind smoking a bit, but I know I could do myself damage if I smoked too much.

Q. Now, some comparison was suggested, in the questions of Mr. Smith, between benzoic acid, and nitrite reacting material, and between acetic acid, and nitrite reacting material, and hydrochloric acid and nitrite reacting material, and you declined to put them on the same basis, notwithstanding benzoic acid might, in certain quantities, be injurious, or poisonous, and so with acetic acid and hydrochloric acid. Now, will you make clear the distinction that is to be made between the benzoic acid, and acetic acid, and hydrochloric acid, on the one hand, as against nitrites on the other?

A. Well, taking them as a group, and taking benzoic acid as representing that group, nature has provided a very satisfactory method, by which, up to a certain point, benzoic acid may be neutralized in the body, and excreted in a relatively harmless form, from the body, through the urine. That is a method of combination in the liver, probably, between benzoic

acid and another substance, so that they are eliminated as a harmless thing, the same way that you might com-

bine two very powerful poisons—as is well known in chemistry, some two very powerful poisons may combine, and,

together, they may make one harmless substance. Now, that is what nature is able to do with benzoic acid, up to a certain point. Now, the taking of such quantities of benzoic acid, as exist in cranberries, and some other vegetables, does not do damage to the body, because this mechanism is there, provided by nature. The fact that it is there, I suppose, might be taken to indicate that nature was prepared for that in the food, and the fact that it is not there for nitrites, I suppose might reasonably be taken, in the other direction, that nature was not prepared for nitrites.

Now, as to nicotine, itself. That is a poison, is it? Q.

I consider it—yes, it is a poison. A.

A very strong poison? Q. A very strong poison. A.

Nicotine is not found in a pure state, very frequently, is it? A. No.

Very dilute, in the ordinary use of tobacco? Q.

It is very dilute in tobacco. Very small quantity. A.

I once read a statement that a drop of pure nicotine on the tongue of a dog would kill the dog. Is that reasonably within the limits of the potency of the poison?

A. I don't know. I suppose that is reasonably within it.

Is strychnine such a poison as nitrites, that nature has no way of defending itself against?

Apparently, there is some little capacity for neutraliza-

That is uncertain. tion.

It is administered, is it, as medicine, sometimes, to stimulate the heart action?

It is used as a medicine, very frequently. Α.

You would consider the addition of very minute quantities of that, to flour, injurious to health?

I certainly should.

1129

And notwithstanding that you have never been called, Q. in your practice, to treat a patient who was suffering from strychnine poisoning taken in the ordinary course

of the consumption of food?

Mr. Scarritt: We object to that as argumentative, if Your Honor please, not calling for an opinion on the case.

The Court: Yes, I believe that is objectionable. Objection is sustained.

I think that will be all. Mr. Butler:

Mr. Smith: I believe that is all, Doctor.

Witness excused.

S. F. Acree, being recalled, was examined further, and testified as follows:-

By Mr. Butler:

Q. Dr. Acree, can you indicate to us the rate of decomposition produced by nitric acid in wet flour, or nitrous acid, or

both?

A. Yes. I did some experiments on that point, to see whether or not, when we mixed water with flour which contained nitric acid, there is any decomposition of the flour by the nitric acid, and to see whether or not that begins at once. I might say that, without going into the details, unless you want them—

Q. Give us the results, as distinguished from experimental

details.

A. Well, the results show that the action begins at once, and that it continues for several days. In order to see further, whether or not this reaction is peculiar to simply nitric acid, or, whether it is due to the fact that the substance is an acid,

and that any other acid might behave in a similar way, I carried out some other experiments along this very

same line, and I have found that, for instance, hydrochloric acid begins to decompose the flour, when it is wet with water; begins to decompose it at once, and the amount of decomposition is analogous to that produced by nitric acid. I might say, further, that, in experiments that I carried out with sulphuric acid, and with sulphurous acid, they decompose the wet flour just as nitric acid and hydrochloric acid do. In other words, and acid, mixed with wet flour, begins at once to cause a decomposition of the flour.

Q. And as to the bleaching effect. Will hydrohloric acid, or chlorine and sulphuric acid, and other such things, take the

color out of flour, too?

A. Yes, they will. I have carried out a number of experiments on that point. For instance, I carried out an experiment with dry flour. I treated dry flour with hydrochloric acid gas. The gas reacts upon the flour, at once, and it bleaches the flour at once, just as nitrogen peroxide would do. I tried also the action of sulphur dioxide gas. That bleaches flour, just as nitrogen peroxide would, and it acts upon the flour, combines with it, partly. I have tried the action of the sulphuric acid, and hydrochloric acid on wet flour, too, and they decompose and bleach wet flour. This is a very general reaction, apparently.

Q. Now, with respect to the effect upon the action—the chemical work of nitrous and nitric acid, of yeast employed customarily for making bread. What can you say about that,

if anything?

A. Will you read that question, please.

(Question read by the reporter.)

A. The action on the yeast?

Q. Yes. Will the yeast prevent the action, chemically? Now, suppose you put yeast into bread, what effect would that have upon the chemical work?

A. The yeast could not, or would not take up the acid, when making the bread rise, certainly not completely. I have,

it, was made to rise with yeast, and I found that the nitrous acid, at any rate, was still there, and as long as it is there, it certainly would just keep on acting on the flour.

Q. Now, this morning, you spoke of chemical action continuing while nitrite reacting material was found in the flour.

Did that accurately express what you intended to say?

A. I meant as long as this free nitrous acid and free nitric acid are present. Of course, if there were enough salt, or metal, or any other substance in there, to neutralize these acids, and convert them into sodium nitrites for instance, or calcium nitrites—

Q. (Interrupting) If it combined into salt, its chemical action would be at an end?

A. Yes, that would end it.

Q. But, would it disclose the ordinary chemical action, by an application of the Griess test?

A. Yes; you would find nitrites still there, if you were to

apply the Griess test.

Q. What is the Griess test? What is it, historically, and

what does it contain, and so on?

A. Well, along about in 1860, there was a man named Griess, who learned that, when you treat the amino compounds with nitrous acid, in the presence of other acid, or alone, even, that the nitrous acid acts upon the amino compounds, and forms a diazo compound. Now, that diazo compound again reacts with the original amino compounds, or with other amino compounds which you may put in there, and form a deeply colored, so-called "azo dye" stuff. I might, if you wish, represent that reaction on the blackboard. Do you wish to have that?

Q. Well, perhaps we had better have it?

A. Well, let us start with the naphthylamine, which is used in the ordinary Griess test. We would have this reaction (indicating on blackboard). That naphthylamine

1132 is a substance containing carbon, hydrogen, and nitrogen, in the proportion of 10 chemical equivalents of carbon, to 7 of hydrogen, to one of nitrogen, and to two of hydrogen, in that grouping. When that substance is treated by the nitrous acid, which we represent, chemically, in this way, HNO2, the first step is, that water is eliminated,

and we have, then, the so-called diazo compounds, in presence of hydrochloric acid, or mineral acid, say, we would get a substance C10H7N2C1, simply plus two molecules of water. Now, this substance, again, then reacts with this original amino compound, another portion of it, present, or, with any other amino compound; and the test is carried out, today, and is known, today, as the "Griess-Ilosvay", or some such pronunciation, which is a Russian name. Now, this diazo compound is treated with another substance, called sulphaminic acid, which has the formula representing one chemical equivalent of nitrogen, two of hydrogen, six of carbon, four of hydrogen, and one of sulphur, three of oxygen, to one of hydrogen. Now, this substance, NH2C6H4SO3H reacts with this one, C10-H7N2C1, and forms the deeply colored dye-stuff that you have all seen, so often, here. The formula would be C10H7-Sometimes we write it this way-N=N. That is the source of the color, which is on the grouping right here (indicating N=N group). And then, C6H3, NH2, SO3H, or, all together, C10H7N2C6H3(NH2)SO3H. There is not very much room for writing, there. Now, that substance is very deeply colored. You could get corresponding deeply colored compounds, by using a various number of other substances, but this is the chief one concerned here (indicating). say you could start with the sulphaminic acid, and treat that with nitrous acid, and get a diazo compound, and treat it with the nephthylamine, and you would get another dve stuff, which would be deeply colored and analogous to this, or NH2C10H6-N2C6H4SO3H, but the main point is, you get a complex substance here, which has a deeply colored grouping in it, and that test is so sensitive, that you can detect one part of nitrites,

for instance, N2O3, in one thousand million, or one bil-

1133 lion parts.

Q. And the quantity of the nitrite is measured by the differences in color?

A. Yes; by the depth of color. This particular modification of the Griess method was made about 1880.

Q. What effect, if any, does the bleaching of flour, by this

gas, have upon the enzymes of the flour?

A. Well, we have, in flour, two different kinds of enzymes, amylolytic and proteolytic. Now, the amylolytic enzymes act upon the starch, and the proteolytic enzymes act upon the proteins. These are both common to most plants. The plants need both enzymes, to make foods for themselves. Now, as a general thing, these enzymes are very sensitive to the action of acids. Acids are deleterious to the action of these enzymes. They prevent the natural changes taking place in flour by these enzymes, in the ripening of the flour, itself; in the aging of the

flour, certain processes must take place. There are certain processes taking place in there. These are changes in the physical appearances of the flour, and changes in organic acid, and other things. Now, these acids would have a deleterious influence on the action of the enzymes, in bringing about the natural aging of the flour. I recall, for instance, an experiment by Loevenhart in which he used one part of a substance, sodium fluorid, in a million parts of water, one to a million. That prevents very seriously the action of an enzyme called lipase, which occurs in our liver. It is one of the enzymes in our liver. That is merely an illustration. These substances often act in a deleterious way. I, myself, have done work with lipase and I have done work with a number of other enzymes, and I have always been very careful to neutralize the acids formed during reactions. In fact, the acids formed, during certain re-actions, make the enzyme quit work, and then we have to neutralize those acids, and when you do that, the enzyme will then begin to work again. I have had experiments like that, in my own researches, which simply show that these acids, in a great number of cases, change the action of those enzymes.

1134 Q. Is this enzymic action a natural process in the di-

gestion of unbleached flour bread?

Yes, I should say so.

Q. And the effect of bleaching it with these acids,—what effect does that have upon the enzymic action?

A. I should say, in general, that it modifies it very seriouslv.

Q. Reduces it?

A. Yes. I have worked with both bleached and unbleached flours, and my experience is that it alters the aging, quite considerably. I do not think that any such acid materials should be added to flour, unless it is certainly proved, first, that they do not have a deleterious action.

Q. Now, as regards the chemical efficiency for work of a very small quantity of this nitrous acid, working over and over again by this method you called this morning "catalysis";

is that true of any other acid's chemical performance?

A. I can illustrate that, I believe, very aptly, by a commercial process,—one of our most important commercial processes of today. We all know that sulphuric acid is manufactured in enormous quantities, and is a thing of very great importance in commerce. Now, if I may use the board to illustrate that question—

Q. If you can do so.

A. In the sulphuric acid industry, sulphur, which we represent by "S", is burned in the air, and it takes up two equiv-

alents of oxygen, and forms a gas, sulphur dioxide, that doubtless all of you have heard of.

Q. SO2?

A. It is a gas which bothers you when you breathe it, has a terrible effect on the lungs, and is a very deleterious substance. Now, the gas is let into large rooms, like this, the walls are lined with lead, and, at the same time, air and steam are let into that room, and the sulphur dioxide reacts with the water, and forms sulphurous acid, which we then write "H2SO3". It is simply a substance formed by the union of the 802 and the H2O.

1135 Q. Now, what is the sulphuric acid?

Sulphuric acid is H.SO.. That is not formed, directly, by this action, but you must have the additional oxygen to form the H.SO, from this sulphurous acid. Now, the air itself cannot oxidize the sulphurous acid readily enough to give you sulphuric acid in quantities which would make it a commercial process, so we have to use, in this form, the oxidizing power of the nitrogen peroxide that I spoke of this morning. And, when we lead not only the sulphur dioxide, or water, and the air, in there, we lead in some nitrogen peroxide, too, and that, then, reacts with the sulphurous acid very readily, indeed, in this way: NO2 gives up one oxygen, to N2SO2, and forms H2SO4 and leaves NO, which is left to unite with O of the air again, to form NO2. Now, that takes place just as quickly as the nitrogen peroxide acts upon the flour, just like that. I am not giving you the details of this, gentlemen, because I don't see any use in going into that, but nitrogen peroxide oxidizes that sulphurous acid, just as quickly as it is taken up by the flour,-at once. Now, this nitrogen monoxide can take up oxygen from the air instantaneously, takes it up right at once, and forms again NO2, and that, again, oxidizes the H2SO3, and so, a small amount of NO3 can cause the air—that is what it is, ultimately, the oxygen, there—to change a great deal of H2SO3 into H2SO4. The NO3 then, is the catalytic agent. Now, in the same, the nitrogen peroxide acts upon the flour,-forms nitric acid, that acts upon the flour. In turn, more NO, is formed, as I have shown by experiment, and the NO2, combined with the water, forms nitric acid, and that acts upon the flour; and, so it goes round and round and round, just exactly as this nitrogen peroxide goes round and round in the sulphuric acid industry.

Q. So that a relatively small amount of this NO<sub>2</sub> may, by this action called "catalysis", work an almost unlimited chem-

ical change upon the substances of the flour?

1136 A. Yes. In other words, it would make the air oxidize, and decompose the flour. Of course, if we have the substance in the open, and in order to get this out—if we had the

flour exposed so that the nitrogen peroxide got out of the flour and got away into the air, that would be a different thing. Of course, then, that is another thing. It would not be acting, but, as long as the nitrogen peroxide is there, it will bring about these decompositions.

Q. I find it stated in this patent, which is marked the Government's Exhibit No. 1, specifications, patent numbered

759,651, stated as follows:

"Two samples of flour were submitted for analysis to a professor of chemistry in the Columbian College, Washington, D. C., one of these samples was taken from a batch of flour, before its treatment by my process, and the other was taken from the same batch of flour, after its treatment by my process. The untreated flour showed the following constituents, in the proportions named: Water, 9.84; Starch and so forth, 74.11; proteids, and so forth, 14.99; ash, 0.44; fat, 0.62. The flour which has been treated by my process, showed the constituents in the following proportions: Water, 10.13"—an increase of water, it will be observed—a small amount—

"-Starch, and so forth, 62.24."-

a decrease of about 12 per cent.

"Proteids, and so forth, 26.71"-

an increase of over 12 per cent.

"Ash, 0.30"-

a decrease of .14.

"Fat, 0.62"—

remaining unchanged.

"It will thus be seen that the flour which had been treated, showed an increase of 11.72 parts of proteids, and a decrease of 0.14 parts of ash, and of 11.87 parts of starch,

and an increase in the proportion of proteids, which is a highly advantageous result, as flour, having such proportion of proteids, is, of course, more nutritive than the ordinary flour of commerce."

Now, I want to ask you whether or not it is chemically possible, by the treatment of flour by this Alsop process, to in-

crease the proteid content of the flour at all.

A. Well, I should say, as an organic chemist, that such reaction is absolutely impossible. The addition of the nitrogen peroxide, and of the nitric acid, will slightly decrease the amount of proteid, there, as I have proven by experiment. That is the only thing that any organic chemist would think of

for a moment, and that it would increase the proteids, and

by any such amount as that, it is absolutely impossible.

Q. Now, with respect to the decrease of the starch, and the corresponding increase of the proteids. Is it chemically possible by any such treatment, to change the starch into proteids?

A. I should say that it is absolutely impossible. No such

reactions, in organic chemistry, are known.

Q. Now, with respect to the increase in moisture. What would be the effect of the treatment by this gas, if any, upon the moisture content?

A. Well, if you were to heat the flour during the bleaching why, naturally it would give off some moisture, or, if you were to bring moist air into contact with the flour, it might take up a little moisture; but, so far as the process itself is concerned, the amount of moisture that it could add or subtract, would be very, very small.

Q. Now, what does the decrease in the ash mean? There is a very serious decrease, from 44 to 30. That would be, 14 is to 44, which is a decrease of about 30 per cent ash. Is that

chemically possible?

A. No, sir. I should say that would be impossible.

1138 The only change that could be brought about there, would be the substitution of, for instance, carbonic acid radicle by nitric acid radicle, and that would increase the weight of the ash in there, if it did anything at all.

Q. Now, how about the effect on nutritive value, of treating the flour with this gas, NO2? Would it increase its nutritive value, leave it unchanged, or, decrease it, or do you

know? Is that your field?

A. I should say that, since my own experiments have proven that the nitric acid decomposes the proteids which, as everyone knows, must be an essential, important food constituent of this flour, you would have a lowering of its value, if anything; and, furthermore, the addition of substances like nitric acid, and nitrous acid, which, as we all know, have a certain well defined deleterious chemical action, that the addition of this would also make this substance deleterious, and would make the flour have a smaller food value, rather than a higher one.

Q. This further statement is found in the patent:

"The second analysis of the flour was conducted by the Henry Professor of Physics, of the Princeton University, and his Assistant Professor, and it was found that, while the untreated flour contained fifty-four-one-thousandths of a gram of nitrogen per one gram of flour, treated flour contained seventy-five-one-thousandths gram of nitrogen per one gram of flour."

Apparently a substantial increase in the nitrogen content of the flour.

A. Why, on the face of it, such a reaction as that could not take place, because you do not add that amount of nitrogen, even if you consider that all of the nitrogen added were converted into the proteid substance. You do not add that amount. And, furthermore, the reactions could not possibly be that kind. Speaking as an organic chemist, I should say that that could not take place.

(A recess was then taken for five minutes, after which 1139 the examination of witness Acree was resumed by Mr. Butler as follows:—)

Q. I will ask you whether or not the bleaching of flour by this Alsop process produces oleic acid in the flour?

A. The nitric acid formed, or the nitrous acid, begin at once to decompose the fats, there, and oleic acid would be one of the products formed.

Q. One of the products of the decomposition?

A. Yes, hydrolysis, or decomposition of the fat.

Mr. Butler: That will be all.

The Court: Claimant's counsel may cross-examine.

## 1140 Cross-Examination

By Mr. Scarritt:

Q. Doctor, you examined this Alsop process, as I under-

stand? A. Yes, sir.

Q. Now, I am no chemist, and, if possible, let us forget these feats of science for a few minutes, and see if we can't get some United States into this, that we can understand what you mean. Now, this process, as I understand it, is simply the air passing through an electric spark, or an electric flame, or arc, passing from one side of it, across the flame, and, after it crosses the flame, it comes in contact with the flour? A. Yes.

Q. That's all there is to it, isn't it?

A. Well, essentially, of course. Of course it goes through a system of pipes, to the agitator, and mixes there with the flour.

Q. I know, but I am talking, now, about when we get up to the critical point.

A. Yes. That is the essential detail of it.

Q. Before it goes into this flame, it is simply air, or atmosphere? A. Yes.

Q. Do you make any distinction between "air" and "atmosphere"?

A. Not in ordinary terms. Not as every one would under-

stand it.

Q. Therefore, it is simply air going through this flame, and, after it goes through the flame, coming in contact with the flour, and instantly, if I understood you, reduces the color of the flour?

A. Well, the color of the gas disappears, it is taken up, at once. That is what I spoke of. The gas was taken up, at once, when you mix the flour up with it.

O. Well, isn't the color of the flour taken up, also?

A. It is bleached very quickly; of course.

Q. That is, the color is taken out of the flour?

1141 A. Yes.

Q. Whatever is formed by the air going through this electric flame, has an affinity for that color in the flour, and

absorbs it, at once?

A. Well, what I mean, there, is, that the nitrogen peroxide begins to act upon the flour, at once, and one of the things it does is to decolorize it. It may not decolorize it just like that (snapping fingers) but it begins to do it.

Q. It begins to do it, in a few seconds?

A. Fifteen, or twenty, or twenty-one seconds.

- Q. It has made it the color of this flour which we have here?
- A. Well, I would say that it begins to bleach it, at once; yes. Just at what time it would have the color of that flour, of course, I don't propose to say.

Q. Now, the nitrogen, and the oxygen, which you say compose the nitrogen peroxide, are both elements of the air?

A. Yes.

Q. Nitrogen is an essential element of the air, isn't it?

A. Yes.

Q. We could not live without it, could we?

A. Live without nitrogen?

Q. Yes?

A. Yes, we could live without nitrogen, as such, in the breathing. The nitrogen, so far as it is known, and so far as I have ever heard, is not used when it is inhaled into the lungs. It is the oxygen that is used up, but not the nitrogen.

Q. I understand the oxygen perpetuates life, but oxygen,

by itself, would kill, wouldn't it?

A. Oh, you could dilute the oxygen-

Q. But wait a minute. Oxygen, by itself, would kill me, wouldn't it?

A. If you would breath it long enough, it might.

Q. In other words, neither animal or plant life could subsist on oxygen, alone, could it? A. No.

Q. Therefore, nitrogen is an essential element of life, isn't it, both in animal and plant?

- 1142 A. Not in the sense that you are trying now to bring out.
- Q. You don't know what sense I am trying to bring out. It is a natural element of the air, then, isn't it? A. Yes.
  - Q. And oxygen is a natural element of the air? A. Yes.
- Q. And, when it goes through this flame, it is still nitrogen, and still oxygen, in different relative degrees to each other, isn't it?
- A. Yes, The original nitrogen and oxygen have been partially converted into nitrogen peroxide, and, therefore, the ratio—
- Q. (Interrupting) There is four times as much nitrogen in the air, as there is oxygen, isn't there?
  - A. That is, approximately. It is about five times.
  - Q. About five times? A. Yes.
  - O. And nitrogen is a free agent, in the air, isn't it?
- A. There is about five times as much free nitrogen in the air, as there is free oxygen; yes.
- Q. And, when it goes through this flame, it is still nitrogen, and still oxygen, isn't it?
- A. Part of it is, but part of it has been converted into nitrogen peroxide.
- O. Well, nitrogen peroxide is simply nitrogen and oxygen, isn't it? A. Yes.
- Q. Nitrogen peroxide means nitrogen through oxygen, don't it.—the literal translation of the words?
  - A. Now, nitrogen peroxide—
- Q. (Interrupting) Please answer that question. You can answer it by "yes" or "no", then explain it, if you want to. Nitrogen peroxide simply means nitrogen through, or nitrogen in oxygen, don't it? A. No. It doesn't mean that, at all.
  - Q. Now, what does it mean?
- A. It means that you have more oxygen—"per" oxide. There is more oxygen.
  - Q. Than nitrogen?
  - A. There is more oxygen in this nitrogen peroxide, than there is in nitric oxide. Nitric oxide is NO.
- 1143 Q. I am not talking about that.
- A. I am trying to explain what this "nitrogen peroxide" means, if you will allow me. Nitrogen peroxide is a name given to NO2, because there is more oxygen—"per"—more oxygen in NO2 than there is in nitric oxide, NO.
- Q. Do you call the air, before it goes through there, "nitric oxide"?
- A. No, sir. I am speaking, now why we name the substance which we, as chemists, call NO2,—why we call it nitrogen peroxide. You were trying to derive the name from certain considerations, and that is not at all the consideration for the naming of NO2.

Q. It is still nitrogen and oxygen? A. Combined; yes.

Q. One part nitrogen, to two oxygen, isn't it?

A. Yes; combined.

Q. That is what you call "nitrogen peroxide"?

A. Yes, and that is-

Q. (Interrupting) And that is nitrogen and oxygen?

A. That is, combined chemically into a substance which is altogether different, perhaps, from either nitrogen or oxygen.

Q. I understand that it is a different mixture of the same thing? A. It is a different chemical compound.

O. Another thing, it is one of your decompositions, isn't it?

A. It is a different chemical compound, altogether,

O. I understand that.

A. You cannot compare nitrogen peroxide, a distinct chemical compound,—you can't compare that with nitrogen and oxygen, as similar substances, any more than you could compare the poisons potassium cyanide with the element potassium, which is a substance which takes fire in the air, and the element carbon, and the gas nitrogen.

Q. Now, you are getting beyond me. I don't understand a word of that, but, after you get through this flaming are with your air, which is composed of nitrogen and oxygen, you still

have these two same substances, don't you?

1144 A. You still have some of the original nitrogen, and some of the original oxygen, and, now, an entirely new thing, nitrogen peroxide, in a compound gas, which is altogether different, perhaps, from either the nitrogen or oxygen.

Q. What kind of a gas?

A. A mixture of nitrogen peroxide, and nitrogen and oxygen and moisture, and other things, which we need not enter into here; the air which is breathed around here.

Q. Now, when this nitrogen and oxygen went through this faming arc, it produced the same substance, or the same gas, that lightning does when it goes through the air, doesn't it?

A. Yes. That is true. Some nitrogen peroxide is formed

under those conditions.

Q. And, when lightning goes through the air, in a thunderstorm, it clarifies the air, don't it?

A. Clarify? What do you mean by that?

Q. I mean, renders it more healthful,—more delightful.

A. I don't know that it does.

Q. More salubrious?

A. Insofar as it produces nitrogen peroxide, it would render it more harmful, because all you have to do is to take some of the nitrogen peroxide into your lungs, and you go to coughing and spitting around.

Q. But you don't cough, and sneeze around, after a thunder-

storm?

A. Well, I know of one instance, when it struck a house in which I was sitting. The ball of lightning went immediately over my head, and I must say that the fumes were so dreadful that I had to leave the room.

Q. How long did those fumes stay there?

A. They commenced to get out right away. Now, if you will allow me—

 Well, you are talking about something I don't know anything about, and you should answer my questions.

1145 Mr. Butler: I insist that the witness ought to be permitted to talk about something.

Mr. Scarritt: I want him to talk about something, but I want him to say something that we all can understand.

The Witness: Well, I will say that, from my own experience, the gas that is formed immediately around this bolt of lightning was anything, certainly, but salubrious; and I would say that, as they got out in the air, and diffused, they would, of course, become less and less harmful; but, because you don't get that, at once, when you are a mile away, that is a different thing.

Q. Now, do these phenomena of the storm produce nitrites, from this nitrogen peroxide?

A. The nitrogen peroxide, in combination with any moisture in the air, will produce nitrous acid, and nitric acid.

Q. And those nitrites are washed out of the atmosphere by the rain, aren't they?

A. If there is a rain; yes.

Q. They go into the ground, don't they?

A. Or something else that collects them.

Q. Or, they go into the cistern, or wherever it is?
 A. Yes; and we can prove their presence, there.

Q. And you can prove their presence in soil, and water, and vegetables, and meats, and flour, and a great many other things, can't you? A. I should think so; yes.

Q. And you can also prove the presence of nitrogen, as such, in these things, can't you,—in the vegetables, in plant life,

and in animal life?

A. Answering that question in this way; If you mean that the nitrogen goes in and forms a part of our body, just exactly as various other substances do, I should say no. I should say that nitrogen occurs, as such, only in our lungs, as we inhale

the air that comes in and out. Of course, there may be a 46 mere trace of nitrogen in our blood, but it is something

that we need not consider.

Q. Yes, we must consider it. There is some in the blood? There is some in the brain,—in the grey matter in your head?

A. Now, let us carefully differentiate, there. You said nitrogen, as such. I take it that you don't mean that.

Q. What do I mean?

A. If you mean that nitrogen is in combination with other things—

Q. Well, take it that way.

A. That's what you really meant, wasn't it?

Q. Well, it was there. I don't know whether it is in union or not.

- A. That nitrogen is combined with other things, and is a part of our brain, and our blood, is true, but not as such, any more than the merest trace.
  - Q. But it is there, and it is in the plant life, too, isn't it?
     A. In combination with other things, it is very greatly.
- Q. Of course, we are not all made of nitrogen, or anything else? A. No.
- Q. It is a wonderful combination of both plant and animal life, isn't it?

A. Yes.

Q. Made up of a great many things. Now, every one of these examples that you worked on the board, there, trying to make it plain, as you say, indicate decomposition, don't they?

A. Well, in some of these cases I was showing how the colors are formed, you know. I wasn't speaking of decompositions, then.

Q. What were you speaking about?

A. I was merely illustrating how these Griess reagents combine to form a kind of compound which is intensely colored.

Q. And in order to do that, you have got to follow a process of decomposition, haven't you?

1. Those things react with the other things; yes.

Q. In other words, in every moment of your life, there is some sort of decomposition going on within your own body, and within the plant life around you, isn't there?

A. Yes, there is,

Q. Now, you take the wheat, from the time it goes into the ground, it begins to decompose, don't it? A. Yes.

Q. When it decomposes it forms another thing, don't it?
A. Yes, Other things are formed.

A. Yes. Other things are formed.
Q. And, immediately upon forming another thing, it begins to form another thing, don't it?

A. Yes. That is true.

Q. And when it comes up into the stalk, there is still decomposition going on?

A. Yes; both decompositions and unions to form other things.

Q. Until it reaches the kernel of the wheat? A. Yes.

Q. Now, the kernel of the wheat is not flour, is it?

A. It is the ordinary flour, with other things, of course.

Q. With other things?

A. Yes. There may be other things there.

Q. But you take the wheat,—that is a natural growth, isn't it? A. Yes.

Q. Flour is not natural, is it?

A. No. It is a thing we get from wheat, of course.

Q. Flour is a thing that is produced by the ingenuity of

man, isn't it, from wheat?

A. Yes, in the particular physical form; of course, there are no chemical changes, however, certainly appreciable, brought about by the mere physical thing of opening this grain, and taking out the middle of the grain. I don't want to be understood that way, a moment.

Q. What I am trying to get at, is this, Doctor: There is a change, from the time the wheat is planted, until it is ground,

isn't there? A. Yes.

Q. Even as soon as you cut the stalk of the wheat off the ground, there is decomposition commences there, isn't

1148 there? A. Yes. That is right.

Q. And when you put it in the shock, and in the stack, and in the granary, there is decomposition going on all the time? A. Yes. That is true.

O. Forming different chemical results? A. Yes.

Q. One after the other, almost as fast as you could count, aren't there? A. Yes,

Q. And when you grind it into flour, take it from the mill, and put it into the barrel, or the bag, decomposition is still going on, isn't it?

A. Yes; of a kind that is agreed by every one to be very beneficial. In fact, they let flour stand, for months, in order to

allow these beneficial changes to take place.

Q. Now, when it is put into this mill, and this nitrogen peroxide is brought in contact with it, it is exactly the same effect on the flour, as it would have if the nitrogen peroxide was from the air from a stroke of lightning, isn't it?

A. I think so, yes; except this: You must differentiate be-

tween the amount that you add, there, and the other.

Q. Assuming it is the same amount?

A. Yes, sir. That is right.

Q. Assuming it is the same amount? A. Yes,

Q. In other words, nitrogen peroxide, through the flaming arc, has the same effect on flour as it would be through natural lightning, doesn't it?

A. Yes, I should say, if the conditions are all the same. We are both trying to arrive at the truth, and I want to understand you, as I want you to understand me.

Q. Yes: I want to understand you, Doctor. We are working together to the same end. Now, that flour, after it has gone through a process of decomposition, from the time it is milled up to the time it is baked in bread, assumed another form of decomposition, don't it, when it is baked into bread?

. Yes. There would be other chemical changes taking

place; yes.

Q. And, when you put yeast in it, you organize another form of decomposition, don't you?

A. That is true; yes, sir.

Q. And when you put water in it, and salt in it, or buttermilk in it, or anything else that the housewife uses to make her dough, to bake her bread,—every one of those things institutes another process of decomposition, don't it?

A. I wouldn't say that every one of them does, but some of them would. The water, for instance, would begin to act

on the flour.

Q. Don't the yeast act on it? A. Yes.

Q. And wouldn't the salt act on the flour?

A. No, I would not say that,

Q. Why do you put it in? A. Make it taste nice. Q. If it don't act on it, why should they put it in?

A. We don't say that the sodium chloride, itself, acts upon that flour. In other words, the sodium chloride is a necessary thing for human life, and personally, I should say it wouldn't make very much difference whether you took the sodium chloride from a teaspoon, or the other way. In other words, the sodium chloride is added to the bread to make it taste nice, and, for that reason—

Q. (Interrupting) But, when the sodium chloride is added to the bread, it dissolves, don't it? A. Yes. It dissolves.

Q. And when it dissolves, it undergoes decomposition, don't it?

A. That is the same question you asked; and I should say we don't know that that sodium chloride does.

Q. It does change, don't it? In other words, you wouldn't have the same chemical result in analyzing that dough, before

and after putting the salt in, would you?

A. No, but that has nothing to do with the question whether the sodium chloride reacts chemically with the flour. I maintain simply this: That, so far as I know, in general, I would say that the sodium chloride simply stays in the flour, unchanged, and that it is eaten, and afterwards used in the body.

Q. Now, when you say "sodium chloride", you mean salt,

don't you? A. Yes, I mean salt.

Q. Let us call it "salt". Let's get down to United States.

A. Well, I didn't notice the use of the word "sodium chloride" instead of "salt".

1150 Q. Now, when you put salt in the bread, it melts, don't it? A. It dissolves, we will say.

Q. And changes from salt into something else, don't it?

A. No. It simply goes in solution in the water.

Q. With the water?

A. It goes into solution in the water. Dissolves in the water.

Q. Don't that change the water?

A. Yes, but let us differentiate carefully between this question. If you want to ask merely whether or not the salt dissolves in the water, and stays in the bread, and we eat it, I will say yes. If you want to insist that the sodium chloride reacts, chemically, with something else,—as I take it that is what you want—

O. Yes.

A. I should say no, it does not; and I think that is the final answer.

Q. Then there is no substance in this salt that is changed, when the salt goes in solution in the water, is there?

A. I should say there is not. Simply a physical mixture.

Q. That is all? I think it is immaterial.

A. Yes, I think it is immaterial, myself.

Q. Now, what does the yeast do in the bread, with reference to introducing bacteria, or anything of that kind?

A. If the yeast is free from bacteria, it doesn't do anything.

Q. Well, is it ever free from bacteria?

A. I should say that we can get yeast that is free from bacteria. Yeast is a plant.

Q. Did you ever see any that wasn't, bought on the market, here? A. That is a different thing.

Q. The commercial yeast.

A. The commercial yeast. If you wish me to answer that question I should say commercial yeast contains bacteria, as a rule.

Q. And when it is introduced in the bread, it introduces bacteria, don't it? A. Yes.

1151 Q. What are bacteria?

A. Bacteria, today, are generally considered to be a form of plant life. They are very small. There are various kinds of bacteria. They are considered as plants. They used to be considered as animals.

Q. Yes,-little bugs? A. Yes, if you wish.

Q. And they look, now, just like they used to, don't they?

A. But we didn't quite understand them, at first.

Q. In order to get a more euphonious term, you call it plant life, so as not to scare people?

A. No, that hasn't anything to do with it. These gentlemen who were working on bacteria, as I understand it, first

thought that they were little forms of animal life, but, today, there is no question but what it is a form [a] plant life.

Q. But it is the form we have known all our life as a lit-

tle animal, like insects, and bugs? A. Yes.

Q. Now, that is produced in the bread. What is that for?

A. What does the yeast do to it?

Q. Yes.

A. The yeast has two enzymes in it,-

Q. Now, please tell the jury what you call an "enzyme", will you. Let's see if we can understand these things while you are on the stand. I don't want to go over this with anybody

else. I believe we can get it from you.

A. All yeast contains two organic substances, in which we know there are enzymes, at any rate two, and may be more, but we know of two, at any rate, today, one of which begins to convert the starch of the flour, ultimately, for instance, into a sugar, and the other one of these converts that sugar into alcohol and carbon dioxide. The carbon dioxide causes the bread—it is a gas, and it causes the bread to swell up, and we

see the little open pores filled with the carbon dioxide.

1152 Q. That means, the bread rises? A. Yes.

Q. Certain amount of bacteria—

A. (Interrupting) I am speaking of enzymes, now, two separate organic compounds, which bring about these things.

Q. And there is gas, there, too, isn't there?

A. There is gas there formed by the action of this second one.

Q. What kind?

- A. Carbon dioxide gas is the one I was speaking of a moment ago.
- Q. Now, the longer you let that bread stand, the longer you have decomposition from that, also, don't you? That is, it is changing all the time, isn't it? A. The yeast is?

Q. No, I mean the bread, itself. A. Yes: the bread is changing.

A. Yes; the bread is changing.Q. Decomposing all the time?

A. Finally would rot, if you let it stay long enough.

Q. Now, when you eat it, masticate it and put it into your stomach, that is a process of decomposition, also, isn't it?

A. Some decompositions would begin, yes, when it goes into the stomach.

Q. Begin immediately? A. Yes.

Q. When it reaches the gastric juices it evolves more readily into decomposition, and passes off through the alimentary canal, and through the bowels, and out?

A. Part of it is absorbed in the intestinal tract, of course.

Q. I am talking about that part which goes through the alimentary canal? A. Well.

Q. Some of it is assimilated, to form the blood? Is that

right? A. Yes.

Q. And the muscle?

1153 A. Yes.

Q. And tissue? A. Yes.

Q. And the brain? A. Yes.

Q. And that is distributed by the blood, isn't it?

A. Yes.

Q. And, in the meantime, the blood throws off any im-

purities that are in it?

A. Yes; certain things, like carbon dioxide, which, being formed by other decompositions within the body, would be exhaled.

Q. And other impurities are [omitted] through the pores of

the body? A. Yes.

Q. And then, after that part of it which goes through the alimentary canal has passed away, it fertilizes the ground, don't it, and comes right back in a cycle? A. Yes.

Q. And that is the way with everything that is in life?

A. Certain things; yes.

Q. That is the way these things progress?

A. Yes, certain of these cycles-

Q. (Interrupting) Now then, Doctor, when ascertaining the chemical analysis or chemical component parts, I might call it of wheat, or flour, or bread, or anything, as we have traced it from the seed up to the time that it is evacuated through the bowels, you will get the results as shown by the chemical action at the specific time that you make your test?

A. You would be getting the end products of it, yes, just

as they have taken place in a million years, perhaps.

Q. And that might be done in one minute, two minutes, or five minutes?

1154 A. It might be slightly different, but it would depend

Q. (Interrupting) Well, all we know is, you can catch it

as you go along?

A. Yes; but, after we learn certain things, we can predict what it will do, absolutely, at a future time, or what it has done in the past.

Q. You think, by observing it, testing all the way along, you can tell by the tests at one time what will happen at a

future time, and what has happened before?

A. In certain connections, we could follow that nicely. We could do that.

Q. Now, I believe you stated that nitrogen peroxide was used to destroy certain organic compounds?

A. Yes. If you wish me to elaborate on that—?

Q. No, I don't care about that. Now, are there any organic compounds in our system, in our stomach, and in the alimentary canal, the bowels?

A. Yes. There are large numbers.

Q. Large numbers? A. Yes. Q. Innumerable? A. Yes.

Q. Now, some of those organic compounds are there for the purpose of restoring the tissue, and blood, and all that sort of thing? A. Yes.

O. And some of them are of no use, at all, aren't they?

A. Yes.

Q. Now, how do you get rid of those that are of no use, at all?

A. Well, I don't know whether we ever do get rid of them. The body excretes some of them, of course. It may be it doesn't get rid of certain ones, and that they act in a deleterious way. That is why, if you get some nitrite of po-

tassium, or arsenic compounds into your stomach, you might say the body ought to get rid of them, but it

can't do it, always.

Q. But it does, some of them?

A. It may get rid of part of them.

Q. And this nitrogen peroxide is one of the ways you get rid of some of them, isn't it?

A. Unfortunately, it gets rid of the very ones that are needed.

Q. And that is the chemical conclusion which you come to, but that it may get rid of some of them that are not needed, don't you think?

A. I wouldn't say. It may be, of course, and it may not.

Q. Now, you say if you put nitrous acid on your hand, that it eats the skin?

A. Yes, It would be very irritating. I think I said nitric, in my testimony.

Q. I mean nitric.

A. I understand that you are speaking of nitric acid.

Q. Now, nitric acid on the hand will burn the hand?

A. Yes.

Q. Now, you don't mean to say that this flour, or any element in this flour, put on your hand, would burn your hand, would it?

A. I mean to say this, that the flour has in it nitric acid, and that that is decomposing the flour, in smaller quantity, perhaps, than it does the flesh, but that it is acting upon the flour, say in proportion to the amount present, just exactly—or, not entirely exactly, but in a manner analogous to the

action of a concentrated acid on your hand. It is simply a

question of amount.

Q. But you wouldn't say that putting your hand right into the agitator of this mill that you saw, you wouldn't expect it to burn your hand, would you?

A. Well, let me ask something-

Q. Or, taking this flour out of the agitator, you wouldn't expect it to burn your hand, would it?

1156 A. Not the flour, directly, but, if I were to take—I could take enough flour, and get the nitric acid out of it, and then burn my hand with it, if much concentrated.

Q. How much flour would you have to take?

A. It would depend on how much it was bleached.

Q. Suppose there is 1.8 parts per million, how much flour

would you have to get, Doctor, to burn your hand?

A. Well, if you don't want me to engage in any mental gymnastics here,—you can understand you can take as much flour, and get as much nitric acid, as you want, and take the nitric acid—

Q. (Interrupting) Supposing that is 1.8 part per million, how much flour would it take to get enough of this nitrogen peroxide out of it to burn your hand?

A. Well, we can illustrate that this way. One drop of concentrated nitric acid, put on your hand, would begin to burn it, right at once.

Q. How much flour would you have to have to get one drop of nitrogen peroxide, or nitric acid?

A. Suppose that you put one gram on the hand, or 9-10th of a gram. If your flour has the equivalent of 9-10ths of a gram of nitric acid in a half million—you said 1.8 to a million?

O. Yes.

A. That would be 9-10ths to a half million. You would have to have about half a million parts of flour to make that 9-10ths acid, and that would burn your hand.

Q. Now, do you know whether nitric acid is used as a medi-

cine, or not? A. No, I don't know.

Q. You don't know? A. No.

Q. Don't you know that-

Mr. Butler: (Interrupting) He is not called as a medical man.

Mr. Scarritt: I understand.

1157 Q. Don't you know that the dispensatory of the United States of America lays down the formula of nitric acid, as a medicine?

A. It might, and might not, I don't know. I would rather not go into that phase of it.

Q. You don't know that? A. No.

Q. Haven't you ever heard of it being used that way?

A. I have heard of potassium nitrate; yes.

Q. Have you ever heard of it being used as an antiseptic?

A. I don't know.

Q. How?

- A. I should think, if it is, it is due to the fact that it does kill life.
  - Q. And it is used as a digestive medicine, in indigestion?

A. I don't know whether it is, or not.

Q. Now, Doctor, if this flour had the amount of nitrite, or nitric acid in it, that you have stated, here, in your experi-

ments, it would not be flour, at all, would it?

A. Now, let us recall the experiment in which I used nitric acid, corresponding to 33 cubic centimeters nitrogen peroxide per kilogram of flour, that would correspond to a flour, bleached with just that amount. I made the experiments under conditions so I would have a flour corresponding to that. I should say that they would be very closely analogous to flour bleached. I would say it was very close to the other.

Q. Now, flour, itself, is not bread? Flour, itself, or gluten,

itself, are not digestible? A. They are not bread.

Q. And they are not digestible?

A. They haven't been made into bread.

Q. They are not natural foods?

A. Well, they would perhaps be natural foods for cows and horses and I imagine that people could live very nicely on the flour, if they had to. We eat corn, right along.

1158 Q. Don't you know that if you put flour into your stomach, it will act as a poison, and cause you to vomit?

I don't know whether that is true. I suppose it would

depend on how much you took.

Q. Now, I was asking you, awhile ago, where you found these nitrites. We find them in the water, you say, and the rain water, and the melted snow?

A. I didn't say anything about melted snow.

Q. Well, are they?

A. You would find them there, I should think.

Q. Don't you know that they are there in rain, without any special electrical disturbance, although it may be greater in an electrical storm?

A. You mean by that, could you find them in rain, even though you had no electric discharge around there?

Q. Yes.

A. Well, I might say that you could, if there were nitrites in the air, formed by some other electric discharge that had gone on before it.

Q. Do you find that in saltpetre?

A. Nitrites, or nitrates?

Q. Nitrites?

- A. The saltpetre is potassium nitrate. The ordinary saltpetre, potassium nitrate, if it is pure, it has no nitrites in it.
- Q. Well, the saltpetre that is put on meat, to cure it?

  A. It depends entirely on how pure it is. If it is pure saltpetre, it would not have.

Q. Well, don't it produce nitrite when you put it on?

A. It is not the KNO3-

Q. (Interrupting) I am not asking you about KNO3.

A. Pardon me. The potassium nitrate?

Q. I am talking about the ordinary saltpetre, that we use customarily to preserve meats.

A. I don't know that it does.

- 1159 Q. Well, isn't it found in our urine? Do you know Prof. Benz Jones, and his works?
- A. I know the gentleman who was here in the trial. Do you mean him?

Q. No, that is not the one.

Mr. Butler: That was Hamilton P. who was here.

The Witness: No, I am not acquainted with this one.

By Mr. Scarritt:

Q. So, nitrites, as such, pass through our system, and are

found in the feces, and the urine of the human being?

A. I would rather not testify to that. It is a medical subject and I am not— I shouldn't be surprised if you did. The body would probably try to get rid of them.

Q. And don't you know that Neumeister says that these are found in the human body, and that the presence is accounted

for by eating vegetables?

A. Found in man? I would rather not testify on that.

Q. They are found in vegetables, aren't they?
A. You might find them in certain kinds.

Q. They are in starch?

- A. They are added to the starch by the bleaching process.
- Q. Well, if they are added by air, they are, aren't they?

A. Yes; that would be true.

Q. It can be added by the air, can't it? In Royal baking powder, aren't they?

A. I don't know whether they have been put in Royal bak-

ing powder, or not.

- Q. Doctor Price's baking powder? A. I don't know.
- Q. And ham? A. I don't know.
  Q. You don't know? A. No.
- Q. You don't know? A. No. Q. Haven't you examined ham?
- A. No, I haven't examined ham.

1160 Q. Examined bacon?

A. No, I haven't examined them chemically.

Q. And sausage? A. No. I haven't examined those.

Q. Now, Doctor, arsenic is a poison, isn't it?

A. Yes. Certain forms of it are very poisonous.

Q. And if you take a lethal dose of arsenic, it kills you, don't it?

A. You could take enough to kill you, of course. People

die from arsenic poisoning right along.

Q. Yet the human system generates a certain amount of arsenic every day, don't it?

Mr. Butler: We desire to note an objection to this. This gentleman was not qualified except as an analytical chemist, and I think the cross-examination should be confined, at least, to the subject of the gentleman's research, and not go into medicine, and surgery, and pharmacy, and veterinary work.

The Court: Oh, I think so, Judge Scarritt. I think you are cross-examining him in a field that he was not called upon, and cannot testify.

Mr. Scarritt: Well, he can say so, if your Honor please.

Mr. Butler: I scarcely think it is for the witness to make objections.

Mr. Scarritt: I just want to ask him a few questions on that.

Mr. Butler: I know you haven't urged greatly on that, but I think we will insist upon our objection, that the cross-examination be confined to the subject concerning which the witness has qualified as a witness.

Mr. Helm: If your Honor please, he has testified concerning poisons, hasn't he?

The Court: I have decided it some time ago.

1161 By Mr. Scarritt:

Q. You spoke of hydrochloric acid, Doctor. What is

hydrochloric acid?

A. Hydrochloric acid is a substance formed by the chemical union of hydrogen and chlorine, as we know it in commerce. I might say that pure hydrochloric acid, is a gas, at ordinary temperatures, under ordinary conditions, and the commercial article is simply a water solution of this gas.

Q. Where is it found?

A. We make it chemically, ordinarily.

Q. Well, isn't it found naturally, somewhere, too?

A. Well probably. Not in any appreciable quantity; it would act immediately upon most of the things surrounding it.

Q. Isn't it naturally in the stomach?

A. Oh, yes. Sure. I thought you meant outside the body.

Q. No, I mean in the human system. You find it in the stomach, do you not? A. Yes, it is present in the stomach.

Q. Now, how much of it is secreted in the stomach, say in 24 hours?

Mr. Butler: That is objected to as not cross-examination, may it please the Court. This witness is not a physician.

The Court: He may answer this question.

A. I don't know. I would rather not answer that question.

By Mr. Scarritt:

Q. Would you say as much as an eighth or a half an ounce?

A. As I say, I would rather not go into that. It is a sub-

ject that I did not take up in here.

- Q. Well, whatever that is, if that was put on the hand, or in the mouth, that would burn the hand, or burn the skin in your mouth, wouldn't it?
  - A. If it were in concentrated state it would, certainly.
- Q. Well, if what is in the stomach in one day were put on your hand, or taken in your mouth, it would take the skin off, wouldn't it?
- 1162 A. If it were concentrated. I don't know whether it would if it were in the natural state. If one should vomit, for instance, and the vomit were to get on his hand, I don't know that it would burn it.

Q. That is an acid that is used as medicine?

A. The hydrochloric?

Q. Or nitric. A. You say it is. I don't say so.

Q. I thought you testified it was?

A. But, mind you, I am not testifying in regard to whether or not nitric acid is used as a medicine, either in concentrated or dilute, or any other state. I want that clear.

Q. How is that?

A. I am not making any testimony with reference to whether nitric acid is used as a medicine in the dilute, or the concentrated or any other state.

Q. But you are speaking of nitric acid, and its effect upon the human system by reason of being in this flour, aren't you.

A. When I testified with reference to the action of the nitric acid on the mouth, and on the hand, I simply told of facts that anyone can see, which I, myself, have seen, that the concentrated nitric acid produces certain effects, and I gave no testimony with reference to whether or not it was used as a medicine.

Q. And you say to this jury that you don't know what effect those acids would have, if taken as medicine, or what effect the same acid would have, if held in the mouth, or put

on the hand; if taken in the stomach?

A. I should say, as I said before, that if you took concentrated nitric acid, as a medicine, attempted to take it into your mouth, that it would eat the lining out of your mouth, just as I said before, and I do not think any physician would give concentrated nitric acid as a medicine.

Q. I don't think so. And that was what you were talking about, and not the nitric acid in this flour—is the concen-

trated form? A. Yes. That is what I said.

1163 Q. Now, you do not pretend to say that that concentrated form is in this flour, do you? A. No.

Q. And you do not pretend to say it is in the bread that is

made out of this flour? A. No.

Q. Then you were talking about either something that was not in the flour, or an additional amount of what was in the flour, according to your idea of what was in the flour?

A. Yes. I was speaking, in the experiments, of the action of this diluted nitric acid in the flour, and I gave the results of the action of that diluted nitric acid, or merely nitrous acid, in the flour.

Q. In concentrated form, and not of the acid that was in the flour?

A. The acid in the flour, of course, would be there in small amount. There would be a decomposition; it would decompose the flour in the manner I have indicated.

Q. Certainly decompose the flour? A. Yes.

Q. But, when you said nitric acid, you were not speaking of the nitric acid in the flour, were you?

A. I was speaking of nitric acid, but I don't mean that if you put flour on your hand, it would eat it up.

Q. Or, if you put the nitric acid that was taken from the flour on your hand, you think it would eat it?

A. I mean if you would take nitric acid out of the flour, and concentrate it in the amount that you brought out, yourself, then that would act upon the hand that way.

Q. In sufficient quantities? A. Yes.

Q. But that nitric acid which you found in the flour wouldn't do it?

A. No. That is too dilute. It decomposes the flour far more slowly than a large amount of concentrated nitric acid,

—for instance, here,—would do. But it would decom-1164 pose it, nevertheless.

#### Redirect Examination

By Mr. Butler:

Q. What would be the effect of pouring ordinary nitric acid of commerce on flour?

A. I have done experiments like that, and the effect would be to decompose the flour. It, itself, would be partially decomposed, and these peroxides—nitrogen peroxide, would be formed.

Q. What was it that burst that bottle, here, when you went on the stand?

A. It was the action of nitric acid present, and the gas that was formed by the action of nitric acid on the flour. Now, that same action goes on in the bleached flour, of course, to a smaller extent, but it goes on just the same, and it keeps going on as long as the substances are there.

Q. Some of Judge Scarritt's questions suggest to me the propriety of asking you to tell us the difference between chemical combination and a mixture. Are the nitrogen and oxygen of the air in chemical combination, or are they simply in a mixture? A. They are simply a mixture.

Mr. Scarritt: He said they were free.

Mr. Butler: But you didn't seem to know how, if the hydrogen and oxygen were not poisonous, and the oxygen and nitrogen in the air were not poisonous, how it happened that nitric acid would be poisonous. I thought that was what was running in your mind, Judge, and that leads to my question.

Q. How is the water?

A. It is a compound of hydrogen and oxygen, two equivalents of hydrogen to one of oxygen.

1165 Q. Now, practically all organic matter, or most of it, consists of carbon, hydrogen, oxygen and nitrogen, in various combinations? A. Yes. Most all.

Q. Now, these substances, nitrogen and oxygen, which are mixed together and form the atmosphere, are, in various compounds, the most poisonous things known, are they not—well, I will say the strongest acids known?

A. Yes. Hydrogen and nitrogen and oxygen, for instance, form two acids, nitric acid and nitrous acid, for instance, and nitric acid is one of the most active acids we have in combination.

Q. Any combination, such as of the hydrogen from the water, and the nitrogen and oxygen from the air? A. Yes.

Q. And, when you put that on a substance like flour and enclose it, it would generate so much of this poisonous NO2 gas that it bursted the bottle there, by the stand, this morning, didn't it? A. Yes.

Whereupon Court adjourned to 10 e'clock a. m. June 15. 1910.

1166

Morning Session.

Kansas City, Missouri, Wednesday, June 15, 1910.

Court met pursuant to adjournment, and the further hearing of this cause was resumed as follows:

On account of the illness of Mr. E. P. Smith, of counsel for claimant, the further hearing of this cause was adjourned until tomorrow, Thursday, June 16, 1910, at 10 o'clock A. M.

Kansas City, Missouri, Thursday, June 16, 1910.

Court met pursuant to adjournment and the further hearing of this cause was resumed as follows, to-wit:

Otto Folin, called as a witness on the part of the libelant, being duly sworn, testified as follows:

# Direct Examination

By Mr. Butler:

Where do you live, Dr. Folin? O.

In Boston, Brookline, Massachusetts. A.

Speak distinctly, Doctor, this room is a little hard to O. make yourself heard in. What is your profession and occupation?

I am professor of biological chemistry in Harvard Medi-A. cal School, Boston. I have a cold, that is why I cannot speak

any more distinctly.

Have you made any particular study or research in respect to bleached flour by nitrogen peroxide gas mixed with air? A. I have not.

By the Court:

Q. You say what?

A. I have not; I have made no experiment.

By Mr. Butler:

Q. You may state in detail your education and profes-

sional experience.

I was graduated from college in 1892, and the following year studied chemistry, chiefly organic chemistry for four years, at the University of Chicago. Then went to Europe and studied physiological chemistry for two years. Then came back and after doing odd jobs around Chicago for about a year I was made assistant professor of analytical and physiological chemistry of the University of West Virginia. At the end of a year I was called to the McLean Hospital in Massachusetts as a research chemist, a position which I held for seven years, until I was called to my present position in Harvard University. I have published numerous papers in this country and in Europe on my researches in the field of physiological and organic chemistry. I am a member of the American Medical Society, of the German Chemical Society of the American Physiological Society, of the Society of Experimental Biology and Medicine, and of the American Society of Biological Chemists.

Q. What is biological chemistry?

A. Biological chemistry is the science which deals with the materials which enter into the makeup of living things, and of the chemical processes, the chemical changes, which those materials undergo under the influence of the living organism. Biological chemistry is divided, particularly speaking, into two large divisions, the chemistry of plants and the chemistry of animal life. My own specialty is chiefly concerned with the chemistry of the animal body and the chemical processes which substances undergo in the animal body, more particularly in the human body.

Q. And your work—present work, has to do then, with the effect, with the chemical change which take place in the human

body? A. Yes, sir.

Q. Are you familiar with the substance known as nitrogen peroxide? A. I am.

Q. You may describe it.

A. Nitrogen peroxide, under ordinary conditions is a gas of varying color, but usually dark red to the tint of brown.

Under pressure or when cool it becomes a liquid, a liquid
1168 which also has different colors, at different times, but
is usually yellow, covered with a red gas which is not
liquified by the oven.

Q. Now, how is this gas turned into a liquid or made liquid

in form, how is that done?

A. It is very easily done by passing the gas, nitrogen peroxide, into a freezing mixture of ice and salt, just as you make ice cream; the gas liquifies in a glass vessel immersed in the freezing mixture and the glass can be sealed and it is kept in the liquid gas, it is incapable of expanding. A better way of cooling it is a mixture of carbon dioxide and ether, by means of which the gas is thoroughly cooled down to where it is converted into liquid form.

Q. Now, is there any difference in its substance or its chemical properties, depending upon the manner in which it is

made? A. There is no difference.

Q. What are the ways or some of the principal ways in

which this gas is produced?

A. Nitrogen peroxide can be produced in a number of different ways, but the principal or most of them is the same, namely, the use of nitric acid. By the action of nitric acid on metals the gas nitrogen peroxide is in most cases produced. You may choose different methods, different metals, but the methods thereby involved are essentially the same; also you can produce it by taking the salt nitrite and treat it with any acid; in that case you don't have to use nitric acid, and the resulting nitrogen peroxide is produced by decomposition of the nitrites. The same process, of course, is produced by the electrical spark, but that is a process with which I am not practically familiar.

Q. Now, is this nitrogen peroxide gas a bleaching re-agent

or agent? A. It is.

Q. Have you yourself ever observed the bleaching proper-

ties, if that is an accurate expression, of this substance?

A. I may say that I have a great many times, but only in small experiments of the kind that is given to chemical students, and later by the teachers for demonstration purposes showing other students how nitrogen peroxide bleaches various substances.

1169 Q. Well, will it bleach various substances?

A. It will.

Q. As for example-

A. Well, in ordinary laboratory experiments you would use a flower or a leaf or a piece of printed calico, or something of that sort, a large number of substances are bleached with this nitrogen peroxide.

2. Now, upon what, in your opinion, does this bleaching

power of the NO2 gas of nitrogen peroxide depend?

A. It depends upon a mixture of nitrous and nitric acid produced, whether the nitric acid is the only cause of the bleaching or whether the nitrous acid takes part, in that, I am not prepared to say.

Q. So that the nitric and nitrous acid together, or one of the other of them acting, becomes, in your opinion, the bleach-

ing agent? A. It does.

Q. Now, is the bleaching process the same or different in case the bleaching is effected by the NO2 gas, that is nitrogen

peroxide, or effected by nitric acid and nitrous acid?

A. The bleaching process is the same because nitrogen peroxide as such does no bleaching, at least that is my opinion, that it does no bleaching because, if you lead absolutely dry nitrogen peroxide into contact with the coloring matter, that color matter is not bleached, so that a certain amount of moisture is necessary, and it is because under the influence of that moisture that the nitrogen peroxide is converted into nitrous and nitric acid that the bleaching takes place.

Q. Now, is there any difference in effect upon the substance bleached, whether the NO2 is used as gas or whether the acids

are used?

A. There is no essential difference in the effects.

Q. Does that hold true in case of bleaching of flour, is the effect the same, in your opinion, or different?

A. In the case of flour, as in all other cases, the effects are

the same.

Q. And I understood you to say that the source of the NO2 would make no difference, whether made from nitric acid, for example, or by means of the electric flaming arc?

A. It makes no difference.

sume the fact to be for the purpose of expressing your opinion, that when flour has been subjected to the bleaching medium employed by the Alsop process for a considerable period of time, that that flour turns yellow, described by some witnesses as a sulphur yellow, by others as an orange yellow, and by others as a bright yellow, various terms have been used to indicate the appearance of the flour that has been subjected to the point, we will say, of over-bleaching. Can you tell us what effect is produced in the flour and what takes

A. In the so-called over-blead

A. In the so-called over-bleaching of flour by means of which the flour is made to turn yellow there has been produced a class of substances known as nitro bodies—nitro bodies—these substances are usually yellow, though some of them are not yellow; in the over-bleaching of flour these are produced by the action of nitric acid on the gluten and the protein. I have made here a large amount of such nitro bodies by mixing flour, instead of with water, with dilute nitric acid to hold eighty parts of flour to fifteen parts of water. At the end of two days this substance had assumed this characteristic yellow color, and it is due to the nitro bodies, and these nitro bodies are characterized by having the NO2 group, formally fastened to the gluten molecules. The NO2 is strongly attached to the gluten and cannot be removed without completely destroying the substance.

Q. The substance that you show the jury is contained in a

little beaker, and we will have it marked.

A. I am not sure whether that would lend itself to the permanent exhibit unless it is closed. I have kept it covered all the time.

Q. The color will pass from it?

A. The color will grow deeper.Q. Lighter or darker? A. Darker.

Q. As time goes on; it is already true on the surface, is it?

A. Yes, sir.

(The beaker referred to by the witness was marked 1171 "Government's Exhibit 47").

Mr. Butler: Exhibit 47 is offered in evidence.

Q. What change in color will take place in the contents of that beaker, Exhibit 47, if it is exposed to the air and by lapse of time?

A. It will tend to grow more and more dark yellow, although I don't believe that the change will be very much more

pronounced than it already is.

Q. Are these compounds spoken of as nitro compounds

identified by any division into classes?

- A. Well, the nitro bodies together make one class of organic compounds. They are then subdivided into a number of different classes, especially into two large classes, but I should say it would go beyond the jury to go into those classifications.
  - Q. But they are divided into other classes?

A. Yes, sir.

Mr. Elliott: You might include the lawyers too, Doctor.

Mr. Butler: Yes, I have no doubt it would go beyond me.

Q. Now, is this yellow re-action or yellow color produced by the nitrous acid in the flour the same as has been spoken of as the [zanto]?

A. The [zanto] protein re-action.

Q. And that means what?

A. That means the yellow color produced by the action of nitric acid on all protein substances, that is, on all the characteristic substances contained in the flesh of animals, in the protein of milk, in the protein of egg, and in the protein of vegetable substances as well, so in this case it is the action of the protein of the flour, which we call gluten for short, although that stands for a mixture of different proteins.

Q. Have you yourself ever seen any flour which was over-

bleached? A. I have.

Q. Giving the [zanto] protein re-action?

A. I have, but not giving any color as pronounced as what I have prepared there myself; the flour which I saw was only a little yellow.

Q. Where did you see it, Doctor?

A. Well, upstairs in the laboratory.

1172 Q. Did I get your answer, you said the flour which you saw was only a little yellow?

A. Only a little yellow, and I saw it upstairs in the labora-

tory upstairs.

Q. How could you know that it was over-bleached flour?

A. I would not have not known it was over-bleached except by comparing the substance which was bleached but was not so-called over-bleached; by comparison with the bleached flour I could readily observe that the one had been bleached farther

than the other, and thereby it became correspondingly more yellow.

Now, you say that the over-bleached flour which you saw was not so yellow as the contents of Exhibit 47. Why was that?

The reason for that, in my judgment, was only because in the bleaching of that flour there was less nitric acid in proportion to the amount of flour used, than I employed in my production of the yellow flour in the way in that exhibit.

Now, in the employment of nitrogen peroxide gas dilute with atmosphere as a bleaching medium, can you from your knowledge of the laws of chemistry and of the chemical powers and characteristics of these substances tell us whether or not the chemical actions taking place in the case of bleaching are the same in kind though they differ in degree, as the chemical actions which take place upon treating flour with nitric acid as you did this flour which is contained in the vessel marked Exhibit 47?

Mr. Elliott: If Your Honor please, I think I ought to object to that. My objection was simply based on the witness's admission that he had not made any experiments whatsoever with bleached flour, as I understood it, and therefore he could not make any comparison.

The Court: I assume that the laws of chemistry are fixed, exact, certain, so far as known by scientists. He may answer the question.

To which ruling of the court claimant then and there duly excepted.

A. In my judgment in the bleaching of flour with nitrogen peroxide it is inevitable that nitro bodies such as are present in that Exhibit 47 must be formed, and this difference between the over-bleached flour and the merely bleached flour, the nature of the case, in my judgment, is only one of degree. There is more in one case than in the other, but they are there in all cases when flour has been bleached with nitrogen peroxide gas.

Q. Now, why do you say that; what are the reasons upon

which that conclusion rests?

That conclusion rests, in the first place, on the inevitableness of the action of nitric acid on the gluten of the There must of necessity be several thousand times as much gluten in flour as there is coloring matter in flour consequently, it follows as a matter of necessity, that several thousand times as much of the bleaching agent will strike the gluten as will strike the coloring matter in the flour; the small proportion of the nitrogen peroxide which strikes the coloring matter will bleach that coloring matter, will destroy it, render it colorless, in the meantime other parts of nitrogen peroxide strike the gluten several thousand times, such strike the gluten and produce a yellow color, so that in this bleaching process, in my judgment, and I have made no bleaching experiments with flour, but, in my judgment, while you bleach the coloring matter that is there, you at the same time introduce another yellow coloring matter.

Q. Generally speaking, what is the color of these nitro

compounds?

A. Most of them are yellow, though some colorless ones are known.

Q. Now, it has appeared in evidence in this case, and you may assume, it to be the fact, that the natural color of flour while it generally presents the appearance, roughly speaking, of whiteness, is a yellowish white, and that the yellowish white color in the flour is made up of two primary colors, yellow and orange in varying degrees, and it further appears, and you may assume the fact to be that upon the treating of flour by the Alsop process the appearance of the flour until it becomes

over-bleached, as it is described, is made whiter; now, 1174 what takes place, according to the laws of chemistry, upon the yellow color and upon the color which are

natural to the flour and found in the wheat itself?

Mr. Elliott: We make the same objection as previously, that the witness had made no experiments with bleached flour.

The Court: He may answer.

To which ruling of the court claimant then and there duly excepted.

A. The proportion of the action of the nitrogen peroxide would not depend on the character of the color, but the same amount of nitrogen peroxide acting on the one hand on an orange color, and on the other hand on a yellow color, will produce more visible change on the orange color, that is a deep orange color being destroyed in the same amount as the yellow color will be equal to having destroyed more color without an equal amount of coloring matter; that is, colors differ very much in the intensity of color which they carry with them, but a deep color is destroyed as easily as a light color. Now, the effect in bleaching a mixture of these two colors would be that at first the color of the flour would seem to be very greatly lightened because the orange coloring matter if such be there in the flour, being destroyed, very readily would seem to result in a very much lighter shade of color; on the other hand

the absorption of the yellow coloring matter in the flour would seem to produce very much less effect on the flour because the

color itself is less deep.

Q. Now, why is it that as the treatment progresses of the flour with nitrogen peroxide gas mixed with air, progresses in degree of intensity, if you like, that the yellow color increases in the flour, resulting finally in the marked [zanto] yellow of the over-bleached flour which you observed in the laboratory, or the contents of Exhibit 47, which is the result of the application of nitric acid to the flour. Don't answer until the gentlemen have an opportunity to object.

1175 Mr. Helm: As I understood your former question you called for an explanation of the change in the color of the flour by natural process, and not by bleaching; that is the way I understood your question; was that correct?

Mr. Butler: The question will speak for itself, I would like to have it read.

Mr. Helm: I think that the witness is not answering the question.

(Question read by the reporter.)

Mr. Helm: I withdraw my objection.

The Court: Very well, you may proceed with this witness.

Q. What is it that makes the flour turn yellow when treated with nitrogen peroxide gas or nitrous acid and nitric acid

and that yellow increase as the treatment increases?

A. By the action of the nitric acid which is produced when nitrogen peroxide comes in contact with moisture, by the action of that nitric acid is produced on nitro bodies, or proteins, that is obtained containing strength chemically bound in the molecule, these NO2 groups obtained from the nitric acid.

Q. That is the fastening on of the NO2 onto the gluten of

the flour? A. Yes, sir.

Q. Producing the nitro bodies? A. Yes, sir.

Q. Does that thing take place in the ordinary bleaching process before the yellow to ordinary observation begins to show itself?

A. In my judgment it begins from the very first instant of the bleaching, and it is not visible; because there is yellow and orange coloring matter in the flour to begin with, but as those organic natural colors are destroyed, their place is taken to a greater or a smaller extent by these yellow nitro bodies.

Q. Is there to be found in nature any of these nitro compounds which produce the yellowness that you have referred to as resulting from the chemical attack of NO2 gas 1176 upon the gluten molecules?

A. Nitro bodies, so far as I know, are unknown in

nature.

- Q. Now, then, it appears in evidence here that flour when freshly milled, other things being alike, is not as white in appearance as the same flour will become if stored and the processes of natural aging be permitted to act. Now, assuming that to be the fact, I want to ask you whether or not in the process of natural aging any of these nitro bodies in the flour which are formed is made so by the bleaching process?
  - A. In my judgment, in my opinion-

Judge Scarritt: I understand he has never made a test of this; he is just simply testifying to what chemically takes place.

By Judge Scarritt:

Q. You said in your judgment you never made any test?

A. I only give it as my opinion. I said at the beginning I have made no experiments, no bleaching experiments, with flour.

By Mr. Butler:

Q. Now, so that they may not misunderstand you, your opinions are based, as I understand it, upon the laws of chemistry? A. They are.

Q. With which you are familiar? A. Yes.

Q. And the action of which you understand?

A. Yes, sir.

Q. As well as the law in gravity when that pencil falls?

A. Yes, sir.

Q. Now, go on and answer.

Judge Scarritt: I object to that as a conclusion, if Your Honor please.

The Court: What is your objection?

Judge Scarritt: The objection to the question is as to the conclusion of the witness as to whether he understands the laws of chemistry to the same extent that he understands the laws of gravitation.

A. I said some of them.

Q. You said some of them?

1177 A. I do, not all of them, lots of them I don't understand.

Judge Scarritt: I object to it as to all of them, because it is a mere opinion of the witness as to the extent of his knowledge, and that is for the jury to determine from his testimony as to his qualifications.

The Court: Oh, I expect when we get down to it, neither this witness or any of us in the courtroom here know anything about the matter of gravitation except we know the result, the increase of velocity, and so forth, as first made known by Isaac Newton or somebody else. I suppose the witness has a right to say that some of the laws of chemistry he knows as he knows the laws of gravity or the result and effect of gravity. Of course I do not expect this witness, or anybody else, unless he was a roaring egotist, would say that he understands everything. He may answer.

Q. Have you in mind my question, Dr. Folin?

A. I have.

Q. You may answer it.

A. In my opinion, no such nitro bodies are produced during the natural aging of flour in the flour.

Q. Well, will any length of time in the natural aging produce, in your opinion, produce [zanto] protein re-action?

A. In my opinion it will not produce that re-action.

Q. Are these nitro compounds injurious or deleterious to health when consumed in food?

Judge Scarritt: I object to that as it has not been shown that the witness is qualified to testify to that effect.

Mr. Butler: How do you mean?

Judge Scarritt: I mean he has not qualified himself as a doctor.

The Court: He may answer the question.

1178 A. Any such nitro bodies are injurious to health.

Q. Why do you say that?

A. For this simple reason, that these nitro bodies contain the NO2 groups, permanent in the gluten molecules of the flour. These are staple compounds. They are not easily destroyed. They are not affected by such procedures as getting the flour—by subjecting it to the action of yeast or to the action of baking or to the action of digestion but they stay in those protein molecules until those molecules get into the system where the protein molecule as a whole is broken up and destroyed and oxidized and in which case those NO2 groups are again set free in different parts of the body in what parts, that I don't know, and there they will develop unquestionable the toxic properties of NO2.

Q. And toxic properties of NO2 means what?

A. Essentially the effect of nitrites and nitrous acid.

Q. And toxic means the poisonous effect?

A. Toxic means poisonous effect; poisons of course in the question of small amounts may be said to be only injur-

ous or only tending to be injurious.

Q. Now, with respect to the degree of injuriousness or poisonousness resulting from the consumption of the nitro bodies, which you say are formed in the bleaching of flour, I would like to have your opinion as to the amount of such effect, compared with the quantity of such bodies consumed?

A. The effect will be corresponding to the amounts of these

nitro bodies present in the food.

Q. Now, if it be made to appear that anybody ever became so sick after eating bleached flour bread as to need a doctor, or to go into collapse or to have any observable symptom of nitrite poisoning, or any observable change of well being, traceable to the consumption of these nitro bodies, would that change your opinion at all as to the injuriousness of these bodies on health? A. Not in the slightest degree.

Q. Why not?

A. Because the effect is in proportion to the amount present and if the amount is sufficiently small it follows as 1179 a matter of course that they escape detection, but because they escape detection that is not the slightest reasan for assuming that they are not there.

Judge Scarritt: We object to this as a mere argument and cross-examination of his own witness.

The Court: Oh, I think not, you may proceed.

A. That is not the slightest reason for assuming that these toxic properties are not there, if they are demonstratively there when larger quantities are used.

## **Cross Examination**

By Mr. Elliott:

Q. Dr. Folin, I want to first ask you what are the factors which ordinarily govern chemical re-actions?

A. The law of mass action.

Q. That is what? Just explain what that means.

A. The law of mass action, according to the law of mass action, the speed of a re-action, the extent of a chemical change taking place, depends upon the quantity of the re-acting substances present.

Q. Yes, sir. Now, in certain chemical re-actions where we know definite quantities will re-act to produce a definite compound, if you change the quantity that re-action will not oc-

cur?

A. That reaction will occur, but you will get a smaller amount of the re-acting substances.

Just simply means only difference of degree?

Only a difference of degree in most cases; there are exceptions.

There are quite numerous exceptions, are there not? Q.

Yes, there are numerous exceptions. A.

If you make a difference just in the quantity the re-action will not occur? A. Yes, sir, I should say so.

Now, then, give another factor, please,

The temperature in reaction.

Q. The temperature? A. Yes, sir,

Q. And very frequently if you vary the temperature 1180 the re-action will not occur? A. Yes, sir.

And another factor?

The law of mass action and the temperature. A.

Let me suggest concentration.

That is included in the law of mass action. A. In mass action you get concentration in that? Q.

A. Yes.

And pressure, to some extent? Q. Pressure, yes, pressure also.

A. And frequently the presence of other substances? Q.

Yes, sir; other substances very often accelerate re-actions in one way or another. An illustration of it we have in the subject of catalysis.

So that in this subject of dealing with the chemical combining of two substances we must always take into account these factors which you have named, must we not? A. Yes.

And the variation in any one of them may produce a variation in the result? A. Yes, sir.

Q. Or often produces no result? A. Yes, sir.

Mostly in no chemical re-action? Q.

Yes, sir; each individual case has to be decided according to the nature of the reaction involved.

Concentration in all those things? A. Yes, sir.

Now, I have understood you to say, I think it is perfectly plain that you have made no experiment whatever with bleached flour? A. That is true.

Either by itself or as compared with unbleached flour?

I will say with one exception, I have looked at the color A. of bleached flour.

Q. Oh, yes, but I mean by experiment?

No experiment. A.

Q. Analyzing it or doing some of those things?

No. sir. A.

So I just want to emphasize this from your personal observation, A. Yes.

You can't say anything? A. Oh, no.

1181 Q. About bleached flour? A. No, sir.

Q. Now, then, I want to ask you as respects the gaseous medium, we will call it, in lieu of a better name, the gaseous medium, which comes from this Alsop machine, have you made any experiments with that gaseous medium? A. No, sir.

Q. Have you ever seen it? A. No, sir.
Q. Then you don't know its concentration?

- A. Only insofar as I have heard testimony in this room.
- Q. I am merely getting to your knowledge; you don't know its concentration? A. No, sir.
  - Q. You don't know the temperature? A. No, sir. Q. Or any of those factors? A. No, none of those.
- Q. So then neither as to bleached flour nor as to this process in controversy do you know anything on the basis of experimentation or of absolute knowledge?

A. Not direct on the substances involved of the flour, I

mean.

Q. We, understand, of course, that you have a chemical knowledge of peroxide and gluten?

A. Which is obtained on the basis of experiment.

Q. I mean on the basis of experiment, you have not dealt with the particular gaseous medium that produced this Alsop process? A. No, sir.

Q. Nor of any flour that has been bleached by it? A. No.

Q. Now, then, I think perhaps there has been some little misapprehension about this subject of peroxide of nitrogen; first I want to ask you if it is not true that you can pick up any textbook and find that it will tell you that peroxide of nitrogen is a heavy dark brown or yellowish gas that is heavier than air and is suffocating to smell, and if enough of it is taken it is poisonous in character; that is a common textbook knowledge, is it not?

A. It says that it is poisonous in character; it does not qualify it, but otherwise your statement is correct. I have never seen a textbook that qualified the statement as to its poisonousness by saying that it depends on

the amount.

Q. Well, I simply mean if you breathe enough of your

peroxide of nitrogen it will kill you? A. Yes.

Q. No question about that. Now, then, take the ordinary atmospheric air containing, as I think everyone has admitted, all of the Government's witnesses, and I assume that you will, traces or minute amounts, or any amount of peroxide of nitrogen, it would not be contended that the breathing of air would produce death, would it?

A. I am not at all sure that nitrogen peroxide except occasionally and temporarily contains any nitrogen peroxide.

Q. All right. A. I mean air.

By Mr. Butler:

Q. You mean atmospheric air? A. Atmospheric air.

By Mr. Elliott:

Q. The purpose of this examination—I am not trying to get at that, that is immaterial, all I want to bring out is this: There would be, would there not, a difference between a body of air containing a minute amount of peroxide of nitrogen and the matter of concentrated peroxide of nitrogen?

A. Yes, if the nitrogen peroxide is present, yes, oh, yes.

Q. Now, then, assuming that the gas from this Alsop machine contained three hundred parts of peroxide of nitrogen to the million parts of air, are you able to say as a chemist, which might occur when that volume of that gaseous medium is brought into contact with flour for a period and exposed to the flour, say for a period of twenty seconds, would be the same as substantially concentrated peroxide of nitrogen brought into contact with flour and kept in contact with it for a period, we will say, of five minutes?

A. I am able to say that the reaction would be the same in quality, but would of course differ greatly as to the quantity

of re-action.

Q. Notwithstanding your statement that in all chemical reactions we must take into effect concentration and all these

things you have named?

1183 A. As I understand it, your question as worded, does not involve a difference in concentration?

Q. Yes, I mean too. A. It does not.

Q. I said, assuming that this gas, that this gaseous medium coming from the Alsop machine and brought in contact with the flour contains peroxide of nitrogen, 300 parts to the million parts of air? A. Yes, sir.

Q. Now, in that dilution can you as a chemist say that the result would be the same as where concentrated nitrogen per-

oxide is brought in contact with the flour?

A. Yes, sir, I think the reaction would be the same.

Q. I know you may think that, Doctor; I am simply saying are you able as a chemist to say that that is the fact; you may have your opinion about it, but can you as a chemist testify to that jury that the results in both cases are identically the same?

A. Mr. Elliott, I am not testifying to anything except my opinion as to what would have happened; I have not made the

experiment you speak of.

Q. Yes, but you are testifying as a chemical expert?

A. Yes.

Q. And you have said that you know pretty thoroughly some of the laws of chemistry? A. Yes, sir.

Q. Now, is this one of them that you know, the law of com-

bination of peroxide of nitrogen?

A. I should say that, in my opinion, the same re-action would happen, but that answer you seem unwilling to accept. Q. No, you said that to Mr. Butler.

Mr. Butler: Just wait a moment, Mr. Elliott. just said it to you, and you asked him then if he is willing to swear to the fact, and he tells you this is a matter of opinion with him in all respects. We have got the facts.

### By Mr. Elliott:

This witness and I understand each other perfectly well, Mr. Butler. I understand, Doctor, you have given your opinion very clearly as to what the result will be, and you answered Mr. Butler as to your opinion. Now, I am go-

1184 ing further than that. You have stated here as an expert that you are familiar, and we know you are of course, with some of the laws of chemistry, and this amongst others, I assume. Now, what I want to get at from you as an expert, is in view of the factors which you have admitted, which govern chemical re-actions, and under the assumption of my question that the dilution of the peroxide of nitrogen in this Alsop machine if it is there, is in the ratio of 300 parts of peroxide to the million parts of air, are you able to say positively that the same re-actions would occur, the same effect would be produced on the flour with that dilute gas as with the concentrated gas?

A. If you will allow me to explain I shall state the evidence on which I base it. I think I am willing to state it as

a fact. May I develop it?

O. If my question is clear you can answer that and then give any explanation you like.

A. It is my judgment, I think it would happen that the reaction would be the same.

You think it would? A. Yes.

# By Mr. Butler:

Now, explain your reason for that.

My reason for that is, I have made no experiments until I came here, that is, I listened to this testimony, it was brought again and again that in the bleaching process to which the flour had been subjected-

# By Mr. Elliott:

Q. Just confine your answer-

Mr. Butler: Just wait a moment; we will have a ruling on whether or not he may answer.

The Court: As I understand, his testimony is that he has made no experiments but he has claimed to know, and with perfect propriety to say that he does know the general laws of chemistry, the action and re-action, and so on, and so on. Now, then, in the question by Mr. Butler he was assuming thus and thus which Mr. Butler claims is in evidence, and by

reasons of these assumptions the witness has gone on 1185 and stated what the laws of chemistry would demonstrate. Now, he is about to give the reason for it, and I don't see the slightest impropriety in it.

Mr. Butler: You may continue your answer.

A. One of the reasons that decides me to answer your question as I did, it has been brought out repeatedly that flour which is left for longer periods of time in these different parts of the bleaching apparatus, and I have never seen it, and it turned yellow; consequently there is not, in my opinion, the slightest reason why the same operation does not take place during a shorter period of time, since I cannot understand, no basis for assuming that the gas mixture is stronger because it is there longer, that is, flour subjected to the nitrogen peroxide in the pipes for two days or three days, or whatever time it may be, turns yellow; therefore that looks to me like conclusive evidence that the nitrogen peroxide in the bleaching mixture used is adequate to produce nitro bodies.

By Mr. Elliott:

Q. All aright. How do you know that flour will turn yel-

low if it is kept in the agitator for two or three days?

A. From the testimony produced in this case, for two or three days to a week. One witness, I don't know who he was said that they cleaned out the apparatus every week, cleaned out the yellow flour which they found there.

Q. Were you here when Mr. Ballard testified?

A. I do not remember any of the names, Mr. Elliott.

Q. Did you hear Mr. Ballard say it might take from three to four months?

Mr. Butler: He didn't say anything of the kind.

The Court: There was some witness, Mr. Elliott, that claimed he cleaned this apparatus out weekly, and at the bottom these gatherings were removed.

Judge Scarritt: The witness said he did not hear it, so that settles that.

1186 The Court: Go on, let's make progress.

A. I have answered.

Q. Now, I understood you to testify that a large number of substances may be bleached with peroxide of nitrogen. I would like to have you name me some substances that you have bleached with peroxide of nitrogen.

A. I have not bleached pure colors with chemical names attached to them; I am not a dye chemist, but I have bleached flowers.

By the Court:

O. You mean blossoms?

Blossoms, I have bleached leaves; I have bleached various kinds of calico cloth, prints on them, and dves of various sorts, but the names of those I don't know.

By Mr. Elliott:

Q. Well, I mean, for instance, did you ever try to bleach corn starch? A. No. sir.

Q. Or rice? A, No, sir.

Q. Or tobacco? A. No, sir.

Q. What effect did the peroxide have on those substances you have, leaves, for instance? A. Discolored them.

Discolored them? A. Yes, sir. Q.

- Made them white, did it? A. No, sir. Q. Q. What effect did it have on the calico?
- Make it whiter, destroyed the color that was there. A.
- O. What was the other substance-flour? A. Flowers.

Q. Blossoms?

Blossoms of various kinds, I couldn't tell you that in A. detail, to undertake what I happen to have on hand at the time an experiment was needed for the class.

O. In the sense that we are using bleaching, did you ever take any substance and make it white with peroxide of nitro-

gen? A. Absolutely white?

Well, in the sense of using it with flour-white? Q.

Well, I have, yes, I have taken calico cloth and leaves and flowers, as I say, for demonstration purposes before classes, yes, and bleached them.

But no food products, as I understand?

No food products, no, sir.

Now, I understood you to testify that either nitrogen peroxide or nitric acid bleaches?

Either nitrous acid or nitrie acid.

Q. Either, yes, that is right, either nitrous acid-well, I have it peroxide, it was nitrous or nitric acid bleaches. Now, have you ever bleached flour with nitrous acid?

A. I have not bleached flour with nitrous acid. I have

not bleached flour with anything.

Q. So you would not be prepared to dispute the statement that it won't bleach flour? A. No, sir.

Q. Have you ever bleached flour with nitric acid?

I have bleached flour with nothing.

So you would not be prepared to dispute that statement either? A. No. sir.

Q. Now, what effect, Dr. Folin, would be produced if I should put some concentrated nitric acid on the flesh—my finger?

A. I have some yellow spots right there.

Q. Turn it yellow? A. Yes, sir.

Q. And if you would put concentrated nitric acid in flour what would be the result? A. Turn it yellow.

Q. And probably char it, would it not, might it?

A. I think not; it will not char it.

Q. Turn it yellow, at any rate?

A. Well, I know it will not.

Q. Well, I think you said there was no difference in bleaching with acids or nitrogen peroxide? A. Yes.

Q. Of course we must accept your opinion as you have not

bleached with acids or nitrogen peroxide? A. Yes.

Q. Also I think you have given it as your opinion that flour that is made yellow by such means as these compounds, nitro bodies. Now, will you give me the bases of your opinion for that, if you are merely speaking from your chemical knowledge you can say so.

A. I am speaking merely from my chemical knowledge.

Q. You never, as a matter of fact, ever got any nitro bodies out of flour that was turned yellow by any bleaching, or so-called bleaching?

A. Not in the sense of identifying any such products

chemically.

Q. Well, that is what usually occurs when we say a thing is present, we establish its presence, isn't it?

A. Yes, Mr. Elliott.

Q. I am going to take your own expression-

Mr. Butler: Let him conclude.

A. I was going to say in the case of the production of nitro bodies with the proteids the re-action, itself, a production of the yellow color is accepted as proof of the formation of those products, consequently we do not go to work and try to identify those products by one chemical process or another, and moreover to identify the presence of small amounts of nitro bodies in a substance like flour, would be an exceedingly difficult thing; I should not venture to be able to do it except perhaps at the end of months of work, for we have no chemical re-agent for nitro bodies corresponding to the Griess re-agents for nitrates; I know of no re-agent for nitro bodies.

Q. Now, tell me, Doctor, what amount of flour did you use

in preparing this Exhibit 47?

A. I used 80 grams of flour and 50 c. c.—50 cubic centimeters or 50 grams in 10 per cent nitric acid.

Q. Just explain to the jury what you mean by that, 10 per cent nitric acid.

A. A 10 per cent nitric acid solution is a solution in 100 grams of which is present 10 grams of pure nitric acid, so that in the 50 grams of nitric acid solution which are there used there was present 5 grams of pure nitric acid.

Q. Now, would that be considered a concentrated or a

dilute form of nitric acid?

A. That is a dilute form of nitric acid.

Q. That is a dilute form. Now, and this, I understand-

I am color blind myself—is yellow? A. It is.

Q. How would the dilution—in the first place, are you familiar with the fact that, it has been stated that the flour in this case contains 1.8 per cent of nitrite re-acting material, but just assume that that be the fact? A. Yes, sir.

1189 Q. Nitrogen as nitrites? A. Yes.

Q. 1.8. Now, could you—I don't want to put you to any mental gymnastics, as one witness expressed it, but could you conveniently tell me, assuming that the nitrous and nitric acid in this flour will you tell me how the dilution of any nitric acid that might be in here would compare with that dilution?

A. Mr. Elliott, the per cent of nitric re-acting material in flour in my opinion has not the slightest bearing on the preceding formation of nitro bodies during the bleaching.

Q. Well, I don't know as I quite understand or what ref-

erence it has to my question.

A. The subsequent analysis of flour as to seized flour, for nitrite re-acting material, has so far as I know not the slightest bearing on the question of the production of nitro bodies

from the addition of nitrogen peroxide.

Q. Well, I didn't say it did, Doctor, it is somewhat difficult because you have not dealt with this flour; but let me ask you your theory. Now, just assume that this Alsop gaseous medium contains 300 parts of peroxide of nitrogen to the million parts of air and is brought in contact with the flour, what do you say occurs there?

A. I say that the gas is practically instantly absorbed by the flour there, by the action of traces of variable moisture, nitrous and nitric acid is produced and those acids are produced in what is called,—no, I was going to state something

which would not hold.

Q. Stopping, however, for another question, it is just that what I wanted now, you get to the point where this gaseous medium comes in contact with the flour, and you say nitrous acid, nitric acid would be formed. Now, I just simply wanted to ask you if you would be able to estimate the dilution of any such nitric acid that would be formed?

A. Well, that will depend on a number of conditions. I imagine that on a rainy day, on a very damp day, you will

have more dilute than you would on a very dry day.

1190 Q. Would you be able to say in general terms how it would compare with the dilution of nitric acid you use there?

A. That is nitric acid produced, it is an answer to your question, I think you will see, that I indicated there, this nitric acid solution produced the yellow color at the end of two days of contact with the flour, as I understand it the yellow flour can be produced in contact with the gases, the bleaching gases, within a week, consequently this acid may be partly perhaps a little stronger, how much stronger I don't know, than the nitric acid produced in contact with the flour.

Q. Well, just let's assume that I could show you some flour that had been bleached by this process and which was

just as white as that jar of flour there?

A. Mr. Elliott-

- Q. What bearing would that have on any opinion you might express as to the dilution?
  - A. As which flour?

Q. That, for instance.

Mr. Butler: That is starch from flour, separated, washed out from flour. I don't think you will see any as white as that.

## By Mr. Elliott:

Q. Any white flour?

A. Mr. Elliott, I defy you to show me a flour which is pure white.

Q. No, I just mean relatively speaking, I do not claim it is

absolutely white.

A. The color of the flour is not the criterion of the amount of nitro bodies that it contains because you may under-bleach the flour, in short, you may bleach it so as not to destroy all the natural color which is there, in which case you might have a yellow flour containing very minute quantities of NO2; on the other hand you may produce a flour which has essentially the same color, but which is over-bleached and which would contain very much larger quantities of NO2.

Q. Now, let me just—what I am putting is very simple, is this: You say it has been in contact with that acid for how

long?

1191 A. After it has been in contact with that acid at least a week, but the color was there at the end of a few days

just as it is now.

Q. Assume at the end of two days or a week, it does not make any difference, now, suppose I bring you some flour that has been bleached by this process, and it is relatively white, whiter than it was before bleaching? A. Yes, sir.

Q. I don't care for the extent of the whiteness; just simply it is whiter than it was before bleaching? A. Yes, sir.

Q. Now, you certainly would not contend, would you, Doctor, that on the assumption that nitric acid is there it may be in any such concentration as there was there, would

you?

A. I would say that the concentration which you assumed there a while ago, namely 300 cubic centimeters per million, would be sufficient to produce the yellow color in the course of time, whether it would produce that color I don't know, therefore, whether the acid is as strong as that I don't know.

By Mr. Butler:

Q. When he says that color, will you have it appear on the record he pointed to Exhibit 47?

A. 47, yes.

By Mr. Elliott:

Q. Don't let's deal with probabilities; I put a concrete case to you, Doctor.

A. I cannot state anything concerning the concentration

of the acids because I have made no experiment.

Q. No, you cannot say, then, from your chemical knowledge that if I had a flour that has been bleached by this process and it is whiter than it was before, that there would not be, on the assumption that there is some acid in that flour, nitric acid, you cannot say that it would not have a different concentration also, this acid that produced that yellow flour Exhibit 47?

A. The color of the flour, I have explained, does not prove

anything as to the concentration of the acid.

Q. Now, if you will just answer that question I'm going to drop it?

1192 A. Yes.

(Question read by the reporter.)

A. Mr. Elliott, I think you and I can get together.

Q. We seem to have some little difficulty. Can you answer that or not?

A. I think that I can answer it in this way, that the concentration of the nitric acid which you would find in flour at any given time after the bleaching has not the slightest bearing on the concentration of the acid at the moment of impact between the air that contains the nitrogen peroxide in that flour after a time the nitrous and nitric acid remaining in contact with the flour, insofar as they have not combined with the flour giving these nitro bodies and combining with the other material as described by Professor Acree, after a time the remaining acid will also abstract water from the flour, then it may become more dilute, and therefore would then of course

be very much more dilute than the acid present in that Exhibit 47.

Q. Now, Doctor, if I took an unbleached flour and put on it the acid in the concentration that you put on that, it would inevitably turn it yellow, wouldn't it? A. Yes.

Q. And if I put that concentration of acid in there by this bleaching process or any other process, it would inevitably turn

it yellow, wouldn't it? A. It would.

Q. Well, that is all I want; perhaps I have been a long time getting at it. Now, tell me about this zanto proteid reaction, what color does that give?

A. The zanto protied re-action gives the yellow color due to the formation of nitro bodies, nitro bodies of the protein

molecules, the nitro bodies are-

Q. I only wanted the color, that was all, yellow color.

A. Yellow color.

- Q. You don't understand that that is bleached flour, do you? A. It is yellow flour.
- Q. You don't understand that any miller would make his flour such a color as that?
- A. I am inclined to believe, without having seen that, that a miller will occasionally have small intervals of flour as 1193 yellow as that.

Q. You mean in the agitator, that has been testified to here? A. In the nooks and corners.

Q. But I mean the bleaching process as used is to make flour whiter, isn't it? A. Oh, yes.

Q. And would not a proper term for that be over-treated in-

stead of over-bleached? A. Oh, yes, certainly.

- Q. Now, tell me about this flour upstairs that you said was over-treated, if I may adopt that word now; where did it come from and how much was it treated or over-treated and by whom?
- A. It was bleached in the laboratory, of course it was only shown me, I didn't see it bleached.
  - Q. And you don't know the appearance of it?

A. Only by hearsay.

Q. We will drop that, then; over-treated at some time?

A. Yes, sir.

Q. You don't know to what extent?

A. Well, only by hearsay.

- Q. Now, tell me, Doctor, what nitro bodies you have ever formed using the dilution of nitric acid that you used in connection with Exhibit 47?
  - A. I have formed the nitro bodies with the gluten of flour.

Q. I mean which ones, are you able to name any?

A. Mr. Elliott those nitro bodies are not known, we don't know just which they are, and I will explain to you why.

- Q. I think we are at one, but you misapprehend me, I don't mean to limit yourself to flour, but I say what nitro bodies have you ever formed of that dilution of nitric acid such as you used?
- A. I don't remember whether I have formed any, in fact, I don't believe I have.
  - Q. You don't believe you have ever formed a nitro body?
- A. Outside of the action of protein I know that they are formed.
- Q. Now, have you ever formed a nitro body with any nitric acid in the dilution which would occur in bleached flour 1194 if it does occur there? A. I don't know.
- Q. Isn't it a fact—well, first let me ask you, these nitro bodies that you say would be formed, how would you designate them as to a class? A. They are substances.

Q. I mean are they aromatic?

- A. They are of the two kinds, aromatic and fatty kind.
- Q. Now, of course, you can't say on the assumption that they are in flour, which they are?

A. Now for certain, I believe they are aromatic.

- Q. Now, I will ask you, Doctor, if you can tell me, Doctor, of any aromatic nitro body that can be formed without the use of concentrated nitric acid and the concurrent use of another strong acid?
  - A. Why, Mr. Elliott, you have it before you in abundance.

Q. I am asking for your knowledge.

Mr. Butler: He pointed to Exhibit 47.

Witness: You have it in Exhibit 47 in abundance; I did not

use any other acid with the nitro.

Q. You have given here nitro bodies. Now, I am asking you—let's put this Exhibit 47 aside for a minute—now, from your knowledge of chemistry are you able to tell me of any aromatic nitro compound that could be formed by a dilute nitric acid in the absence also of some other strong acid?

A. Yes, sir, it would form a great abundance.

Q. Now, just name me a few.

A. Well, it is a dozen years since I studied the organic chemistry and the names slipped me; there are a hundred thousand odd compounds in organic chemistry and a man does not remember those, but I will say that in phenol derivatives, substances called phenols, to which carbolic acid belongs, you can easily get nitro bodies with dilute nitric acid, nitric acid with more dilute than I have used there, and without the presence of any other.

1195 Q. What is that one?

A. Phenol, that is aromatic compounds containing

hydroxyl.

Q. You understand, Doctor, I am putting these under instruction, I don't know this chemistry myself, but I want to put it to you, from dilute nitric acid you say that you can form an aromatic nitro compound? A. I do.

Q. All right. I suppose you have never washed out gluten

from flour, or done any of those things?

A. Yes, sir, I teach that to my students every year.

Q. Sir?

A. I teach that to my students every year.

Q. Well, from this flour in suit?

A. Oh, no. We have the flour in our laboratories.

Q. Now, Doctor, I will ask you this question: Is flour a simple or a complex substance?

A. It is a very complex substance.

Q. Are you able to give in general terms about the number of substances it is said to contain?

A. Oh, I should say it would probably contain somewhere

between a dozen and fifteen substances.

Q. I believe as high as twenty, some of them?

A. It may be found higher, it will depend on how you look at it, in a large measure.

Q. It is a very complex substance, is it?

A. Very complex.

Q. Now, I find some questions which were to be put to you about the change that occurs in the coloring matter?

A. Yes.

Q. The orange and the yellow? A. Yes.

Q. What experiments have you made with the coloring matter of flour? A. I have not made any.

Then that was based simply on your general knowledge?

1196 A. It was based on the—I think it was assumed in the question.

Q. Well, it was simply on the basis,—it was not on the

basis of any actual experimentation? A. No.

Q. All right, that is what I want. Now, you stated that there were no nitro bodies in natural aged flour, and I think I would agree with you, but you have not made any experiments in that regard, have you? A. No, sir.

Q. Now, then you have expressed the opinion that this bleached flour would be injurious to health, in your judg-

ment? A. Yes, sir.

Q. Or might be? A. Yes, sir, would be.

Q. And that, as I understand it, is based on your statement that if the effects of the administration of a large amount

of a substance are demonstrable, that it follows that the use of a small amount produces the same effect but in a less degree, isn't that correct?

A. Yes, in the absence of any reason for believing the con-

trary to be true.

- Q. Now, do you know of any substances which are considered of a poisonous character which you believe may be taken into the system in small quantities without producing harm? A. Yes, sir.
- Q. Would these be illustrations: Potassium chloride, common salt, baking powder, acetic acid of vinegar, alcohol, benzoic acid and benzoate of soda? A. They will do as examples.

Q. Those things may be poisonous in large quantities, but

taken in small amounts are harmless?

A. I would not be equally positive for all of those, more

positive in some cases than in others.

- Q. And would the basis of your opinion as to the 1197 harmlessness of a small amount, we will say, of benzoate of soda, be influenced by the fact that that occurs naturally in certain fruits or vegetables?
- A. To some extent, yes, but of course that is by no means the only reason.
- Q. But I believe you stated once before that you regarded that as the strongest reason, did you not?
- A. One of the chief reasons, does not that expression occur there?
- Q. Well, I am reading from a former deposition; I am not pinning you down to this if you say it is not correct?

A. No. sir.

Q. The question: "Q. Well?" "Yes, in fact I regard that as one of the strongest reasons why benzoate of soda, at least

for occasional use, might be regarded as harmless".

- A. I said as one of the strongest, and, Mr. Elliott, that is the way you put the question there, it does not quite represent the facts, it is partly that it occurs in natural substances, but it happened to be natural substances which I from childhood had been consuming myself, in very large amounts; the lawyer in the case, when I testified, pinned me down for two hours on that, so that it was partly expert testimony and partly talking as an individual from personal experience.
- Q. Yes, but you did express an opinion and have expressed an opinion? A. Yes.
  - Q. As I read to you? A. I have.
- Q. That these various substances would be harmful in large doses and perfectly harmless in small doses?
  - A. In sufficiently small doses.

Q. Now, what would you say as to nitrites or nitric reacting material, on the assumption that that occurs in the saliva, and is being swallowed from infancy to old age?

1198 A. I should say that nitrites would not be one of those substances which would be poisonous in large amounts, and not deleterious in small amounts.

Q. And that opinion would be based on your knowledge of the kind of nitrites in poisonous doses, would it not?

A. It would be based on the knowledge that it is poisonous in large doses, and on the absence of any reason for believing that it is not poisonous also in small doses, the burden of proof must always be towards showing that it is not poisonous in small quantities.

Q. Now, let's assume that it has never been shown that anybody was ever injured by eating any food containing nitrites, would that not be an indication that minute amounts of nitrites are not harmful? A. It would not be an indication.

Q. Would not be an indication. Now, that as I understand it, is simply from your knowledge of the use of large amounts?

A. And of the knowledge of the limitations of our exper-

Q. Just what do you mean by that?

A. I mean by that that we are always subjected to a great many injurous influences which we do not know, with which we have not had sufficient experience to be able to guage them exactly.

Q. Well, but we have had experience with those substances,

and saliva, haven't we?

A. We havent had any opportunity to determine how in-

jurious the nitrites of saliva may be.

Q. But we have had opportunity of knowing as to other substances that are harmful in large doses and are harmless in other doses. Now, what is the distinction you make?

A. The distinction in that in those—in the substances which are harmless in small doses, we have definite reasons for be-

lieving that they are harmless in small doses.

Q. And you think with the knowledge that no body 1199 has been found that has been injured or been made sick or nobody has discovered that they had been in any way affected by enting foods with nitrites, on that assumption you say that would not be any indication at all?

A. No, sir, it would not.

Q. What would you say on the assumption that minute amounts of nitrite or nitrite re-acting material are taken into the system, assuming the same substance is taken in always through the saliva, what would you say as to the human system having become immune to the action of those minute amounts, or dormant to that?

- A. I would say that there is not the slightest evidence tending to show that the human system has become immune to nitrites.
  - Q. Well, is there any evidence to show that it has not?

A. There is.

Q. What is it?

- A. Because it is definitely poisonous in sufficient amounts.
- Q. Other than that is there any testimony that the minute amounts of nitrites such as much be taken from the saliva has ever produced any harm?

A. Well, sir, so far as I know here cannot be immunity against one quantity and no immunity against a smaller quanthere cannot be any characteristics.

there cannot be any sharp line there.

Q. Can nitrites be oxidized? A. Certainly.

A. Can nitrites? A. Yes, sir.

Q. That is a matter of common knowledge, isn't it?

A. Yes, sir, at least that is my impression; I don't remember having oxidized nitrites to nitrates, but the—

Q. You know that is a chemical fact?

A. I presume that to be a fact.

Q. Did you ever get or observe a zanto proteid re-action in commercial bleached flour; by commercial bleached flour
 1200 I mean flour in the condition after it has been bleached and sent out in the market for sale?

A. I have never seen a bleached flour in the market.

Q. Now, I want to come back just a minute to this concentration business and especially of nitric acid, as any possible compounds, you have stated that that flour in Exhibit 47 contains nitro bodies? A. I have.

From the fact that it is yellow? A. Yes.

Q. Now, does nitric acid act the same way in all dilutions?

A. In just what dilutions it would act, I don't know, just how dilute.

Q. It acted with that one? A. Yes.

Q. I want to give you the illustration that I think I gave to Dr. Mann or at least to one of those scientists. Is it within your knowledge that if you put dilute nitric acid, mix it with benzine, that it will produce no compound whatsoever?

A. It will not produce any compounds, I believe.

Q. Then if you add a higher concentration to benzine you will produce a mono-nitro-benzine? A. Yes, sir.

- Q. And if you go still further and use a concentrated nitric acid, add it to benzine, you will have a di-nitro-benzine, practically different chemical substances and another combination in the third case? A. Yes.
- Q. All dependent on the strength or concentration of the nitric acid?
  - A. Yes, sir, and you can get some more.

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Q. And there would be others? A. Yes, sir,

Q. I think so.

A. But you understand, Mr. Elliott, that benzine is a substance that re-acts with comparative difficulty with nitric acid.

Q. Will nitric acid produce a nitro body from olive

1201 oil, do you know?

A. I don't think it would.

Q. Would it produce it from the oil of bitter almonds?

A. The oil of bitter almonds, I should think it would, but I am not ready to state definitely.

Q. You would not state definitely in either case, as I under-

stand? A. No, not definitely.

Q. I want you to tell me what nitro compounds, if any, that you formed in your laboratory or any place as such, so that you could designate them and tell what they were by name?

A. I have not formed those for so many years, they do not come into our studies in physiological chemistry, except in connection with this very re-action here, the action of nitric acid on proteins and those are not sufficiently definite to be called definite compounds to which one can affix a name.

Q. Well, I want to be fair with you, I don't want to be unfair. Is the basis of your opinion about nitro compounds simply the observation of this yellow color in Exhibit 47 and other similar experiments which you may have performed, or

have you made any nitro compounds at any time?

A. I have made them. Q. You have done so?

A. Yes, but I don't now remember.

Q. You don't know now what they are or what they looked like? A. Yes, they looked like yellow.

Q. They all looked yellow?

A. I have made a meta-nitrate, amido or nitrate benzoic acid. I have published a paper, Mr. Elliott, published a paper in 1898 in which I think you will find the preparation of probably three or four new nitro compounds which had never been and which I have there described but

prepared before and which I have there described, but

1202 that is many years ago and I don't-

Q. Have you made any experiments with the flour that was seized in this suit? A. No, sir.

At this point court took a recess until 2 o'clock P. M.

Pursuant to adjournment court met at two o'clock p. m., Thursday, June 16, 1910, and proceeded with the trial of said cause further as follows:

William F. Boos, called as a witness on behalf of the government, being first duly sworn, was examined by Mr. Butler, and testified as follows:

### Direct Examination.

Q. Where do you live, Mr. Boos?

A. I live in Boston.

Q. And what is your profession?

- A. I am pharmacologist and chemist of the Massachusetts General Hospital, and a physician, with a consulting practice, in the city of Boston.
  - Q. What has been your education along the lines of these

subjects?

A. After receiving my bachelor's degree at Harvard College, in 1894, I went to Heidelberg, and, after two years' study there, I received the degree of Doctor of Philosophy in

1203 chemistry. I returned to Harvard, after that, and taught, there, for one year, chemistry, in the academic department. Then, I entered the medical school, and studied medicine for four years—the Harvard Medical School. After completing my course of medical study, I entered the Massachusetts General Hospital, as house physician. I served a term of eighteen months in that capacity, then, I went to Strasburg University, and studied for two years as research student in pharmacology or experimental therapeutics, which is the same thing. For two years more I was assistant to the head of the pharmacological department in the University of Strasburg. Then, I returned to America, to the position which I now hold, at the Massachusetts General Hospital.

Q. You, I think, gave testimony, by way of deposition, in

a bleached flour case, pending at New Orleans.

A. Yes, sir.

Q. That was last January, I think. Prior to that time had you given the subject of flour bleaching, by means of nitrogen peroxide gas, any particular or special consideration?

A. I had not.

Q. Have you, since then, seen an Alsop bleacher work?

A. I have. Q. Where?

A. I believe in one of the mills of the Northwestern Milling Company, Kansas City.

Q. Southwestern? A. Southwestern Milling Company.
Q. The Rex Mill. The same mill referred to by the other

witnesses who were out there? A. Yes. Q. Did you see any gas employed in bleaching, there?

A. I did.

Q. State the circumstances of that, to the jury.

A. I saw the gas as it was developed in the generator, or electrifier, by means of the flaming arc. I also saw it, 1204 as it was collected by members of our party from the

1204 as it was collected by members of our party, from the bleaching apparatus. That is, from one of the pipes leading into one of the chambers of the bleaching apparatus.

Q. That is, one of the agitators? A. Yes.

Q. Collected in flasks?

- A. It was collected in flasks, or in graduated cylinders.
- Q. And, under different conditions and adjustment of the machine, so as to get different intensities of the gas? A. Yes.

Q. Did you see the particular flask taken by Dr. Hulett?

A. I did.

Q. Was that dense enough so it could be seen?

A. It could be seen, yes.

Q. 300 parts to the million? In the other specimens, was it visible?

A. It was. They were very distinctly visible, the other specimens.

Q. What is the nature of this gas?

A. This gas is a compound of nitrogen and oxygen, with a formula NO2, or, N2O4, as the case may be, depending upon temperature and pressure. There is, probably, also a certain amount of each chemical substance, present in this gas. Shall I proceed?

Q. Yes, as to its characteristics, if taken into the body

by inhalation or ingestion, or otherwise.

A. It is a brownish red gas, which, upon being inhaled, acts as a powerful irritant to the mucous membranes of the respiratory tract.

Mr. Helm: Do I understand that the Doctor is speaking of this Alsop Process, now, or NO2?

Mr. Butler: Well, haven't we got to the point where the Alsop gas is NO2, yet?

The Court: I do not hear you, Mr. Butler.

Mr. Butler: He asked whether we were speaking of the Alsop gas, or NO2, and I inquired whether we had not reached the point that the Alsop gas was NO2, yet. I thought that was conceded by Mr. Smith, at least.

Mr. Helm: I simply wanted to know what he was talking about.

The Court: I know, but Mr. Helm—I am not criticising anybody, and I trust I am not getting impatient with anybody. I am not assuming anything, but, have been waiting, now, for two weeks, to see whether you proposed to tender an issue, before this jury and myself, as to whether there is any difference in the production of this gas, whether it is by the Alsop process, whether it is by iron injected into nitric acid, or whether it is by the chemical process of nitric acid and sulphate of iron, or anything else. Now, I am not saying this now, in a spirit of criticism, but I have assumed, without

being a chemist, and largely uneducated in these matters. whether it is possible for there to be any difference, and, without commenting on this evidence, so far, I have seen no one thing to indicate to me that it is of the slightest concern how this nitrogen peroxide is brought about. Now, if you intend to raise any issue on that, it might be well for you, perhaps, to say so, now. If you do not, say so.

Mr. Helm: Mr. Elliott has answered that, but he may do so again, if he desires.

The Court: You do not intend to raise any issue on that, do you?

Mr. Elliott: I do not intend to raise any issue, if Your Honor please, that nitrogen peroxide, if it is generated in this machine, or any other way, is different,

The Court: Whether it is in the Alsop Mill, or whether 1206 it is in a laboratory, it is all the same?

Mr. Elliott: It is all the same, wherever generated, or however generated. Our contention is as to the concentration of this gas, and the length of treatment.

Mr. Butler: But you said "If it is generated in this machine". You do not deny the machine generates NO2?

Mr. Elliott: I say if nitrogen peroxide is in this Alsop machine.

The Court: Or, NO2?

Mr. Elliott: It is just the same as nitrogen peroxide generated chemically, or any other way.

The Court: In the laboratory, or in the mill?

Mr. Elliott: Yes, sir, it is. Not a bit of difference. We never have contended that.

The Court: That is what I am going to tell the jury, unless shown something to the contrary.

Mr. Elliott: Absolutely, nitrogen peroxide is the same, wherever made.

The Court: Then, I think we need not accumulate any further on this.

Mr. Helm: I would like to state my objection. My point was, he was stating he had been out to the mill, and had seen this gas, and went on to describe its characteristics, and said it was a dark brown colored gas. I wanted to know, then, whether he was talking of that gas, or of the Alsop gas,

The Court: Well, what is the difference?

Mr. Helm: Well, there may be a difference, as Mr. Elliott suggested, in concentration.

The Court: Well, now, you say there may be. Now, is there?

Mr. Helm: I think, in concentration-

1207 The Court: (Interrupting) Oh, in concentration, yes.

Mr. Helm: He spoke of a dark brown gas, and I wanted to know whether he was then talking about the gas he saw out there, at the mill, or NO2 generally.

The Court: One mill, here, manufactured this gas by nitric acid, and wires of iron—soft iron. I don't know whether anybody else had testified, or not—

Mr. Butler: (Interrupting) Mr. Mitchell, testified,

The Court: But, it can be produced by nitric acid, and sulphate of iron, or it may be produced by the flaming arc, of two electrodes, such as are in the Alsop process. Now, the point I make, is, why accumulate on this subject matter, unless you intend to raise an issue about that?

Mr. Elliott: We do intend to raise this issue, if Your Honor please, that there is a difference between a body of air having a minute amount of nitric acid—

The Court: (Interrupting) I am not talking about a minute amount. I am talking about the same amount.

Mr. Elliott: Now, I say, the amount that the Alsop would have, and such as their witnesses have testified to, 300 parts per million,—there is a difference between that, and concentrated nitric acid.

The Court: I know, but, with the same concentration, same amount, it is immaterial whether produced in the Alsop, whether produced by the jug of nitric acid, or the rod of iron, or nitric acid, or sulphate of iron, or by the electrodes, or the electrical machinery. It is utterly immaterial.

Mr. Elliott: Yes, as to the nitrogen peroxide, but, whether the treatment is the same, we will take issue.

The Court: Well, I am going to so charge the jury, unless I see that there is an issue about that. I am going to tell this jury it is utterly immaterial how this gas is manufactured, unless, later on, you are going to tender an issue on that.

Mr. Elliott: Certainly I am going to contend there is a difference in concentration, and in effect.

The Court: All right. We will wait and see what you have.

By Mr. Butler:

Q. Now, Doctor, I asked you to tell what NO2 is, as to its characteristics, and you said, on inhalation, it was irritating, corrosive, or something like that. You may continue your

description of it.

- A. It is a gas which produces an irritating effect on the mucus membrane of the respiratory tract, with a consequent feeling of suffocation, and, with possibly coughing—well, coughing, without any doubt, in fact, if it is added in sufficient amount.
  - Q. Is it recognizable by its odor, or smell?

A. It has a very characteristic odor.

Q. Did you smell it, out in the mill, in bleaching?

A. Yes.

- Q. In the ordinary operation of the machine, out there?

  A. I did. It was noticeable on that entire floor where
- the machine was located.
- Q. Now, the color of it depends upon the degree of concentration? A. Yes, it does.
- Q. The more concentrated, the denser the color, and so forth? A. It is.
- Q. And that was varied, in the various specimens taken in that mill? A. Yes.
- Q. One, was shown to be three hundred to one thousand million, and the other was taken at one thousand to a million so far. Is it poisonous? A. It is,
- 1209 Q. What do you mean when you say a substance is poisonous?
  - A. Shall I give the definition of a poison?

Q. Yes.

A. A poison is a substance which, by virtue of its chemical constitution, produces chemical morphological molecular changes in certain organs, these changes then leading to the impairment of function in the organ or organs affected.

Q. Now, does the treatment of flour gaseous mediums such as you saw Dr. Hulett take, impart to the flour, or pro-

duce therein, any poison or poisonous substance?

A. It does.

Q. And how may they be described, by name?

A. This gas, when introduced into the flour, produces nitrous and nitric acids, in equivalent amounts, one part of each on account of the moisture which the flour contains, and which combines with the gas to form one part each of nitric acid and nitrous acid.

- Q. And are those acids poisenous?
- A. They are.
- Q. Now, there is in evidence, here, an iron pipe, which was brought from Mr. Krite's mill, had been in use about six months, right at the agitator. I would like to have you tell the effect of passing this gas through an iron pipe—the chemical effect.
- A. The effect would be one of corrosion. That is to say, the gas would attack the iron, and cause loss of a substance in the pipe—that is, a certain corrosive effect, which would cause the pipe to lose part of its substance, and, in time, it might cause the corrosion to be so complete as to eat holes, as it were, through the pipe.

Q. Now, assume the facts to be, that bread made from this flour contains nitrites, or nitrite reacting material, to the extent shown by the fluid in this tube, on Exhibit 30, which was

tested in the presence of the court and the jury, I would 1210 like to get your opinion as to whether or not there has been a poisonous substance added to the bread by the bleaching of this flour that was seized.

A. There has been.

Mr. Scarritt: We object to that as invading the province of the jury, and not a proper hypothetical question.

The Court: Objection overruled.

Mr. Scarritt: Exception.

By Mr. Butler:

- Q. Now, what would you call such substance—what may they properly be called by name, that was added to this bread by reason of the bleaching of this flour, up at the Lexington Mill?
  - A. Nitrous and nitric acids.
- Q. Do the nitrous and nitric acids remain through the flour and the bread, as such, or by combination into salts, or other compounds?
- A. They may be present as such, and they may be present in the form of salts, and they may be present, or there may result from the presence of those substances, organic compounds, derivatives of those bodies.
- Q. Now, this nitrite reacting material, as I understand it, was shown by this test, here in the presence of this jury?
  - A. Yes.
- Q. Now, assuming that such bread be eaten, or bread and other foods made in whole or in part from this flour, with such customary regularity and amounts as the food products of flour are usually eaten by the people, I would like to have your opinion as to whether or not the food made from this flour seized, is or may be injurious to the health of the consumers.

Mr. Scarritt: Same objection last stated.

The Court: Same ruling.

1211 Mr. Scarritt: Save an exception.

The Witness: May I answer?

By Mr. Butler:

Q. Yes.

A. I consider that injurious substances—did you ask me whether it was injurious, or whether injurious substances had been added?

Q. No, I asked you whether the customary use of it, as bread and food products, made in whole or in part from flours, are customarily used by the people, whether it would be injurious to health.

A. I think it would tend to be injurious to health.

Q. Now, how so? Give us the reasons for that faith. Give

us the effect of it, in such food.

A. Because the presence of either nitrous acid or nitrites would cause these substances to be absorbed into the system, where they would exhibit the characteristic action of nitrites, or nitrous acid. Nitric acid, present either as such or in the form of nitrates, would exhibit the characteristic action of nitrates, or nitric acid. And so would the organic compounds which are formed in this flour from the action of the nitric acid, also cause injurious effects after their absorption into the system.

Q. Now, as the characteristic effect of nitrites, taken into

the stomach?

A. When nitrites are taken into the system, and are absorbed from the gastroenteric tract into the blood, we observe a distinct sequence, or phenomena. First of all, there is flushing—that is what you mean, for me to give a description of the action?

Q. Of the action of nitrites.

A. First of all, there is a flushing of the face and neck, which may extend down as far as the upper part of the breast. There is also, as has been found,—it is due to a dilation, or stretching of the blood vessels of the face and neck. There is

also, at the same time, a dilatation of the vessels in the meninges or lining membranes of the brain, and also of

the vessels in the brain, itself. Very soon after this first flushing, there is felt an accelerated pulse in the temporal arteries, which causes us to feel a sort of hammer-like effect in this artery. This is due to the action of the nitrites on a certain nerve, which, normally, keeps the heart from going too fast. This nerve is depressed, or paralyzed by the action of the nitrites, so that it no longer controls the heart, and the heart

begins to beat more rapidly. This beating of the heart more rapidly, with the limited dilation of blood vessels in the head. neck and chest, causes, at first, a rise in blood pressure. Very soon, however, the blood pressure falls considerably, which is due to a paralysis of the vaco-motor center, we call it-that is to say, a certain center in the medulla, which controls the dilatation and contraction of the blood vessels in the body. This paralyzes this center, and there is a general dilatation of blood vessels, in consequence of the paralysis. This, of course. accounts for the great fall in blood pressure. There may be, at the same time, a certain degree of dizziness, and there may be a mild narcosis, which means a slight loss of consciousness. Patients affected by these substances may sway, or even fall, when they are under the influence of these bodies. In all cases there is a tendency to the formation of met-hemoglobin in the blood. If a sufficient amount of these substances is introduced into the system, the entire blood of the person turns a very much darker color than it normally has. Normally, the blood is bright red, the color that you know as crimson. After these substances have been introduced into the blood, outside the body, or inside the body, the blood turns to a chocolate color. Of course, the degree of this chocolate color is dependent upon the amount of these substances taken into the system. But, there will be a formation of met-hemoglobin, probably with the smallest amount taken into the body, only it would be so

slight that we would not be able to detect that formation.

This formation of met-hemoglobin is a very serious mat-

ter for us, because the red coloring matter of the red blood corpuscles, the function of which is to take up oxygen in the lungs, and to carry that oxygen throughout the body, and to give it up to the cells of the body, and the structures of the body that require it, loses its function. The red coloring matter can no longer either absorb or give up oxygen. Therefore, we have a lack of oxygen, a suffocation of the entire system, and death, in cases of nitrite poisoning, is caused by this suffocation of the blood through the formation of met-hemoglobin.

Q. You say that the amount of change of the hemoglobin into met-hemoglobin depends upon the amount of nitrites taken?

A. Upon the nitrites absorbed into the blood.

O. And as to the function performed by the hemoglobin, and whether or not, by the change to met-hemoglobin, the power to perform the function is retained?

A. I have stated that the hemoglobin, or red coloring matter of the blood loses its function of carrying oxygen from the lungs to all parts of the body that require it, and, all parts require it constantly.

Q. Have you, yourself, made any experiments for the purposes of illustration, to show the effect of nitrites upon the blood of an ox, for example? A. Very frequently, yes, sir.

Q. And, since you came here, have you done it?

A. Yes, I have done it since I came here.

Have you the specimens here in court, that you may show the jury. For identification, let us have them marked.

The exhibits referred to were by the reporter marked "Government's Exhibit "48" and "49".

These will not keep indefinitely, because there is abso-

lutely no preservative added to the blood.

Are the contents of these little bottles, which are marked "48" and "49", respectively, quantities of blood 1214 of an ox?

A. I obtained these two specimens, by dividing a specimen of blood which I obtained from the Armour Packing house.

Q. In this city?

A. In Kansas City, Kansas, right across the line. I divided that into equal portions.

Q. Now, explain to the jury how you did it, how you treated

the portions, what the difference is, and what causes it.

A. I took the defibrinated blood. When the blood is drawn from the steer, or, when it gushes out of him, the blood is whipped, to cause the clot to separate, and the clot is removed, and this results in what we call the defibrinated blood, and the corpuscles are intact. That is, they have not been destroyed in this blood. I took this defibrinated blood, in equal parts. To one I added sodium nitrite, in solution. To the other I added the same quantity of water, so as to keep the volumes the same. The sodium nitrite in the blood, gradually produced this change into a chocolate color, as we see it.

Q. That is, in number 49?

A. Yes. Which is met-hemoglobin. This (indicating) is the color of the bright arterial blood, as we call it. This is the color of the met-hemoglobin blood.

And this color is, as you see, very permanent.

Mr. Elliott: Doctor, it may not be important, but would you mind giving us the quantity in each case?

The Witness: I used one part to two thousand in the blood -one part sodium nitrite, to two thousand of blood. course, I used a large amount, in order to make the effect very pronounced.

Mr. Elliott: I mean the amount of blood and liquid you added-the solution.

The Witness: I think my nitrite was dissolved in twenty-five cubic centimeters of what we call the normal salt solution, and I added twenty-five cubic centimeters, also, to this, without the nitrite. The nitrite was in one, and not in the other.

Mr. Butler: Did you want him to tell the volume of the blood, before the addition, Mr. Elliott?

Mr. Elliott: Yes, that is what I wanted.

By Mr. Butler:

Q. If you can tell, Doctor. If not, approximate it. Did you measure it?

A. I did measure it, yes, but I do not remember just exactly. It doesn't make any difference.

By Mr. Elliott:

Q. Well, just about?

A. About one hundred cubic centimeters of blood, I think, I used in each case. I think it was exactly one hundred cubic centimeters. You can do it in a test tube. You can do it in anything.

Mr. Elliott: Oh, yes.

The Witness: The brown color would be turned long before the quantity I used, only I wished to make it more striking, so I used a lot—one part to two thousand. Shall I give this to the jury?

Mr. Butler: If they desire to pass it around.

(Exhibit handed to the jury.)

Q. Now, you spoke of defibrinated blood. Do the red corpuscles remain in the blood—the defibrinated blood, or do you

remove the red corpuscles?

A. The number of red corpuscles which remain in the blood is dependent on the skill of the person, to defibrinate it. You can defibrinate the blood in such a way as to remove only a very small proportion of the red cells. In other words, you can get almost a colorless clot out of the blood, by whipping it the right way.

Q. But, in these particular specimens of blood, which 1216 are offered in evidence here, are there red corpuscles

there? A. They are intact.

Q. Now, what produces the chocolate color, where you

added the sodium nitrite?

A. This chocolate color is produced by a chemical compound brought about by the sodium nitrite in a manner we do not know, which is called met-hemoglobin, whereas, the red substance—the bright red substance, oxyhemoglobin, and the

brown substance, is met-hemoglobin.

Q. In Exhibit 49, which I believe is the number of the chocolate colored specimen, was there produced met-hemoglobin? A. There was, yes, sir.

Q. And is it met-hemoglobin which causes the change in

Q. And, as to the degree of change in color, upon what does that depend?

A. That depends upon the quantity of nitrite which is added

to the blood.

And does that color vary with the concentration, just as does the Alsop bleaching gas? A. It does.

Q. The denser it is, the more marked the color?

A. Yes.

Q. And, when you attenuate it, the lighter? A. Yes, sir.

And, in this particular specimen which you have brought to court, here, you say you used one part to what?

A. To two thousand of blood.

Q. One part, to two thousand of blood?

One part sodium nitrite to two thousand parts of blood. A.

The degree of concentration testified to by those who took that gas, was three hundred parts of NO2, to the million, and one thousand parts to the million of NO2.

I have not made any experiments to determine how sensi-A.

tive this reaction is.

Q. The purpose was for the purpose of illustrating and 1217 defining the change from hemoglobin to met-hemoglobin?

Now, the question is whether or not change of the same kind, but less in degree, would take place upon the addition of

any amount of nitrites. A. There would.
Q. Now, are there some substances, Doctor, like vinegar, or acetic acid, salt, baking powder, benzoic acid, or benzoate of soda, alcohol and the like, which are common articles of use for human consumption in varying quantities, which may become poisonous upon the ingestion of appropriate quantities?

A. Yes, sir.

Now, are there any substances known to your profession, falling within the definition of poison, not of that character, where the poisonous action results, same in kind, but differing in degree, where any quantity, however minute, is taken? A. There are.

Q. Can you mention some of those, aside from the nitrites we have spoken of?

A. Strychnine, atropine, heavy metals, such as lead, copper, mercury, physostigmine.

By the Court:

Q. What?

A. Physostigmine, which is an alkaloid, and many other alkaloids; chloride of lime, chlorine gas.

Q. Cyanide? A. Cyanide of potassium.

Q. That seems to be a well known poison, here. You spoke of heavy metals. What do you mean by that—salt, or metallic forms? A. In either.

Q. Corrosive sublimate one? A. Yes.

1218 Q. Paris green—is it of that character, or not? Is that a copper salt, or is it copper and arsenic combined?

A. It is a salt of copper and arsenic.

Q. How about Paris green, that is used for poisoning vermin, sometimes? A. Very poisonous substance.

The Court: How is aconite?

The Witness: Aconite, I think is the most powerful poison we know. I mean by that, aconitin, the active principle of the aconite plant.

Q. That is sometimes used for medicine?

A. No, not regular medicine.

Q. Well, aconite—the substance known popularly as aconite?

A. Is not used by the regular school of medicine, so far as I know.

Q. But it is used sometimes by the medical practitioners,

for the purpose of controlling fevers, isn't it?

A. Aconite, when given internally, produces fallen blood pressure, and we do not give any substances to produce fallen blood pressure, and there is no therapeutic indication to pro-

duce a fall of blood pressure.

Q. Now, with respect to the nitrites which were taken from this bread, here, Exhibit 30. I want you to tell us in which class of substances it belongs—whether with the salt and the baking powder, and the alcohol, and the vinegar, or does it belong to the same class as these other things—corrosive sublimate, aconite, and Paris green?

A. Belongs in the [glass] of corrosive sublimate, strych-

nine, aconite, and Paris green.

Q. Now, as to the degree of injuriousness by the consumption of bread containing such nitrites. Upon what does that depend?

1219 A. It depends upon the quantity of nitrites which are

present in the bread.

Q. Now, you told us that nitrates were produced in the flour by the action of the nitric acid, distinguished from the nitrites produced by the action of the nitrous acid. I would like to have your opinion as to whether or not these nitrates, so produced, may or may not be commonly an injurious factor in food made from flour. A. They may.

Q. How?

A. Because the nitrates may be converted, or will be converted to a certain extent, into nitric acid into the stomach, if they are not present as nitric acid to begin with, and nitric acid is a powerful poison.

Q. Now, with respect to the nitro compounds, which Dr. Folin testified to here this morning. Are they to be considered the same thing as we now have spoken of the nitrates resulting from the nitric acid, or are they something else?

A. The nitro compounds are among the most notorious

poisons of organic chemistry.

Q. Well, now, what is a nitro compound?

A. A nitro compound?

Q. Yes.

A. It is any substance—an organic substance which is produced by the action of nitric acid upon that substance. It has that group, NO2, in its molecular make-up. That is to say, if you start with benzine, you replace by the action of the nitric acid upon benzine, one hydrogen in that substance, by the group NO2, and you produce, there, from benzine, or benzol, nitro-benzine, or nitro-benzole, which ever you wish to call it. You may have dinitro or trinitro. That is to say, you may replace more than one hydrogen atom, by the NO2 group, and have a substance containing more nitro groups.

Q. That is produced by the action of nitric acid?

1220 A. Yes.

Q. Does it take any specific quantity to produce any reaction or is there always reaction, and it only takes a specific quantity to produce discoverable reaction?

A. There is always reaction.

Q. Now, what is the xanthroprotein, or proteic action?

A. Xanthroprotein is the name which has been given to the yellow substance which is formed by the action of nitric acid

upon organic matter.

Q. Now, assume that this Alsop bleaching process, when used for the purpose of treatment of flour, increases the yellow color in the flour, what, in your opinion is the reaction evidenced by that yellow? A. I do not think I quite understand.

Q. Assume that, by the treatment of flour with the nitrogen peroxide gas mixed with air, increases the yellow color in the

flour,—that is, makes the flour yellow, what does that yellow color indicate? What action or reaction?

A. It indicates the formation of xanthroprotein in the

flour.

Q. That is the nitro compound?

A. Nitro compound of gluten. Probably a larger part nitro compound. These nitro compounds form in the gluten of the flour.

Q. Now, is that one of the class of poisons, which you said

were the most notorious known-organic poisons?

. Yes, it belongs to that.

Q. Now, as to the degree with which the same will be produced—the rapidity,—upon what does that depend, when you are treating flour with nitric acid, or NO2, which forms in the nitric acid, in the presence of water?

A. That depends upon the quantity of NO2 which is pre-

sent, acting upon the flour, at any given time.

Q. Are the nitrites sometimes used for medicinal purposes?

A. They are.

Q. And you have described, I think, the characteristic 1221 effect of injection of them? A. I have.

Q. Do you know of any cases of nitrite poisoning?

A. Yes, there are many of them.

Q. Some that have come under your own observation, some

that are reported?

Q. I have seen one, but there are twelve or more which have been described in the literature, some of them were of fatal issue.

Q. Now, as to the origin of nitrites, when found in the

saliva of human beings. What do you say of that?

A. I think that, normally, there are no nitrites present in the saliva. They are produced there, simply due to uncleanly conditions, which we cannot always avoid, in every-day life, which make it possible for certain bacteria, which we call the nitrifying bacteria to develop in the cavity of the mouth, and to produce nitrites as a result of the economy of their life.

Q. Now, if it is true, as has been suggested here a number of times, that people swallow nitrites in their saliva, in varying quantities—perhaps find it in smoked meats, and in some of the vegetable food products of the market—what is the effect

of the eating of such nitrites?

A. The effect would be exactly the same as the eating of ni-

trites in any substance.

Q. Now, I will ask you, have you ever known of a case of a person being taken ill from nitrite poisoning, from eating bleached bread? A. No, sir, I have not.

Q. Or smoked meats, or anything of that sort?

A. Well, I have known people to be ill from eating smoked meat, and I have been called in for such cases, but whether they were under the head of ptomaine poisoning or nitrite poisoning, I am not prepared to say.

Q. You would not be prepared to identify the poison?

1222 A. No, sir.

Q. Now, if in your experience and observation, you had not come across a patent sick from nitrites in food, how can you say that the adding of these minute—sometimes described by our brethern on the other side as "unweighable" amounts

of nitrites to bread-how can that be injurious?

A. It is injurious to the extent to which the nitrites are present. The injury resulting may not be noticeable to us, but we are constantly contending against injurious effects which are acting upon our organism, and the fact that we do not always feel well is due to these many little injurious causes which are acting all the time. Throughout any day of twentyfour hours, we do not always feel the same. We have moments of what we call well-being. These are the normal momments. Then, we have moments when we do not feel quite so That is due to the fact that there is some cause or other acting to detract from our well-being. We cannot put our finger on that cause and say what it is-perhaps we may, sometime[may] years hence. We do not know now, always, what the cause is, that makes us feel badly. Undoubtedly, however, there are a great many different causes, and most of them are bacterial in nature, which are acting constantly upon our well-being, to produce a diminished sense of well-being, and I think not unlikely the nitrites produced in the mouth and absorbed, may be one of those causes, but it is very difficultpractically impossible to say that, definitely.

Q. Well, now, if nitrites are found in the saliva, and sometimes traces in the air, and they are injurious to the human family, has not nature made a mistake, as suggested by our learned brother on the other side, in some questions, in permitting these things to be, and therefore, should we not put

some more into the flour, in order to-

Mr. Scarritt: (Interrupting): I object to this as a mere argument, if your Honor please, getting too far away 1223 from the issues in this case.

Mr. Butler: I thought you considered your cross examination as germane.

Mr. Scarritt: Well, I am not asking you to criticise my cross examination.

Mr. Butler: I would not do that, Judge Scarritt.

The Court: Without reference to what has been said, I think the objection should be sustained.

By Mr. Butler:

Q. Now, with respect to the adulteration of foods by the addition of poisonous and injurious substances, you may tell us whether or not in your opinion foods may be adulterated by such additions, when the consumption of the same may not produce evidence of injury, or poisoning, manifesting itself by symptoms or apparent effect?

Mr. Elliott: Just one moment. May I have that question repeated?

(Question read by the reporter)

Mr. Elliott: I think that is objectionable, if your Honor please, as calling for a conclusion of law.

Mr. Scarritt: It is paradoxical.

The Court: You may answer.

Mr. Scarritt: Save an exception.

Mr. Butler: Go on.

A. I do, most decidedly.

Q. Is it necessary that the addition of poisonous or deleterious substances to food, be such that the consumption of the food will show itself by symptoms, in order to justify a conclusion that the same may be injurious to health?

Mr. Scarritt: We object to that, if your Honor, please.

The Court: You may answer.

The Witness: It is not necessary for me to make any such assumption.

1224 By Mr. Butler:

Q. Now, as to the health. How about the human family—are we all alike, in our powers of resistance, or is there great variability in that regard?

A. There is a great difference in the powers of resistance,

among various individuals of the human family.

Q. Now, as to power to endure the eating of nitrites in bleached flour bread—would that be constant, or variable?

Mr. Scarritt: We object to that, if your Honor please, because the witness says he don't know anything about it. He has never observed any effect or result from it, whatever. He knows nothing of it except in the concentrated form.

The Court: He may answer.

Mr. Scarritt: Save an exception.

A. Yes, that would be variable.

By Mr. Butler:

Q. Illustrate that, and tell us how.

A. Whereas a grown man might feel, or might have as a result of the ingestion of bread made from bleached flour, only a very slight action, due to the nitrites, an action which he would not perceive, that action might become considerable in an infant, so as to produce, in that infant, a more or less serious disturbance of health.

Q. And would the danger to the infant increase as the

quantity increased?

A. It would, decidely, children being particularly sensitive

to the action of nitrites.

Q. And would the amount of these poisons increase in the flour, as the bleaching increased, and the yellow develop?

A. Yes, sir.

Q. Some question was propounded, reference being made to the United States Pharmacopoeia, I think—

1225 Mr. Butler: You did that, didn't you, Judge Scarritt?

Mr. Scarritt: I cannot pronounce that. I did not say anything about that. I spoke about the United States Dispensatory.

Mr. Butler: Well, you meant the same thing.

The Court: That may be a subject that is quite interesting, but I do not hear a word of it.

Mr. Butler: I wanted Judge Scarritt to help me decide who used the term United States Pharmacopoeia in the examination.

Mr. Scarritt: I did not refer to that.

Mr. Butler: Well, by some other gentleman on the other side, as justifying the use of nitric acid.

Q. Now, what is the practice, nowadays, as to the administration of nitric acid, or nitro-hydrochloric acid, for medicine?

A. If I remember correctly, Judge Scarritt referred to the United States Dispensatory, which is a modification of the Pharmacopoeia.

Q. Very good. I could not pronounce "dispensatory".

A. I should say that a physician does not follow the dispensatory in his ideas of treatment. The dispensatory, on the other hand, is supposed to be a help for him to find certain things. Because a certain substance is stated in the dispensatory as being used, or having been used, is no reason why it should be rational to use it, the use of nitric acid, today, by any intelligent physician, would be, to my mind, almost criminal.

Q. And what is the practice of physicians, generally, in that regard? What was it with respect to nitric acid, heretofore, and what is it now?

A. Nitric acid was used, at one time, with the idea of increase oxidative processes in the system; that is to say, when they thought oxidation was sluggish, as they termed it, they

gave nitric acid to increase the oxidation, with the 1226 theoretical idea that the nitric acid would give up some

- of its oxygen, as it does, for instance, in case when it is brought in contact with metals, and that this added amount of oxygen would help to carry out the oxidative processes in the organism, but nothing of the sort occurs, when nitric acid is given. Nitric acid was also given in the form of nitrohydrochloric acid, and there it is not only the nitric acid that acts, but free chlorine, which is a very serious poison. The nitric acid, taken into the system, acts as it always does upon organic matter, and produces the same effect upon the mucus membrane of the stomach, that it does in the flour. It produces the xanthro protein action on the tissues. It produces organic nitro compounds, and that is the action which always takes place.
- Q. In case of a drop of hydrochloric acid, resulting from this NO2 mixed with water, comes upon human flesh in the laboratory, and so forth, what happens as to the color?

A. It produces a yellow stain. I have one, on my fingernail

(showing fingernail to the jury).

- Q. And the color of the contents of exhibits 47? A. Yes.
- Q. In case of the pouring of this gas, made by the Alsop machine which you saw, upon the flesh, what is the effect?

A. It produces the same yellow color.

Q. That is, the xanthro?

A. Xanthro protein reaction.

- Q. That is, this word "xanthro" means yellow; somebody told me? A. Yes.
- Q. In the case of pouring the nitric acid upon flour, in a vessel you may tell us whether or not gas will be formed?
- A. If nitric acid is poured upon flour in a container, nitrogen peroxide gas is formed by the action of the nitric acid upon the flour.

Q. Is its odor recognizable? A. Yes, sir.

- Q. Form in quantities that will blow out corks and 1227 burst bottles, and things of that sort? A. Yes.
- Q. Now, if there only be a little bit put on, will the same kind of action take place differing only in degree?

A. The same kind of action will take place, differing only in degree.

Mr. Butler: I think you may cross-examine.

The Court: Well, it is hardly time for recess, but I always dislike breaking into an examination of counsel. We will take recess for a few minutes.

(Recess taken as above ordered.)

## Cross-Examination

By Mr. Elliott:

Q. Dr. Boos, I understood you to say that this Alsop gas, or this gaseous medium that comes from this Alsop machine that you inspected, was visible. Do you know what voltage was on the machine, and what amperage?

A. No, I cannot tell you that. I did not go into that.

Q. You did not go into that? A. No.

- Q. Do you know, at the time you examined this gas, whether it was turned off from all the agitators, and simply passing through one?
  - A. Examined the gas where? You mean in the agitator?
    Q. In this Rex Mill. Is that where you were examining

that? A. Yes.

Q. Where you say you saw the gas?

A. I thought I saw the color in the very act—in the act of its burning, as you might say, where the flaming are is discharged in this box.

Q. Now, you mean in looking through the glass?

- A. Yes, in this box where the flaming arc was, I thought 1228 I saw the color there.
- Q. Did you examine it at the agitator, where it goes into the flour? A. Yes.

Q. Did you see the color there?

A. I did not see it. You cannot see it because it goes through a system of iron pipes into the agitator.

Q. You did not remove the pipe to look at the gas, and see

if you could see it?

- A. I could see it when it was allowed to flow into a glass receptacle. That is, it was allowed to flow from the iron pipe into a glass receptacle. Then I could see it, in that receptacle. Whether I could see it issuing from the pipe or not, I do not know.
- Q. Now, was that the same glass receptacle that Dr. Hulett had? A. Dr. Hewlitt and Dr. Acree, and Dr. Mitchell.
- Q. That was the same experiment that he testified to, when he made a vacuum in the glass?

A. Yes, that was Dr. Hewlitt.

Q. And that is the glass you refer to?

A. That is the one Dr. Hewlitt had. You could see it flow in, because where the gas was simply allowed to stream through the graduated cylinder, it replaced all the air in there.

Q. For some time? A. Yes. That was Dr. Acree.

Q. Did you hear Dr. Acree testify about that? A. I did.

Q. And did you see it, in the same way he did, by comparing it with another glass tube, that did not have the gas in it?

A. Yes.

Q. And a white back ground? A. Yes.

Q. Now, Doctor, I want to ask your opinion—I want to get your opinion of what happens to flour when this gaseous medium from the Alsop machine comes in con-

tact with it. What do you say occurs?

A. The gaseous medium, which contains nitrogen peroxide, is brought in contact with the flour. The flour contains a certain amount of moisture, and the nitrogen peroxide combines with this moisture, and forms one part each of nitric and nitrous acid. As a consequence of the presence of these two substances, nitric and nitrous acid, the flour is bleached. Whether that bleaching is done by the nitric acid, alone, or by the nitrous acid and the nitric acid, I do not know. I have been led to believe, from what I have seen, that nitric acid certainly is a factor in the bleaching.

Q. Now, then, so far, I believe you are in accord with

some of the other gentlemen? A. Yes.

Q. You say this gas comes in there, and it splits up into

nitrous acid and nitric acid? A. Yes.

Q. Now, we have got that far. Now, I want to ask you as to these compounds, of nitric acid and nitrous acid. Do you say that there are nitrites, as such, and nitrates, as

such, in flour treated by this process?

A. I think that it is possible to assume—I think it may be assumed that nitrates may be present. That nitro compounds are formed, we can tell from the reaction of the gas upon the flour, producing the typical color of that nitro compounds.

Q. We will just limit it, for the minute, to nitrates, and nitrites. I want to get your opinion as to whether you think that nitrates, as such, and nitrites, as such, are in the flour

treated by this Alsop medium?

A. I think they are.

Q. You think they are, as such?

1230 A. I think they are.

Q. That is, that these two gases unite with certain salts, or bases in the flour, and produce nitrites and nitrates?

A. I answered that question, assuming you included nitric acid and nitrous acid, when you said nitrites and nitrates. I know that nitrous acid and nitric acid are present; to which extent nitrates and nitrites are present, I do not know.

Q. No, I do not ask you about the extent, at all. I was just trying to get, definitely, what you think is here.

A. Yes, only you limited me afterward to the compounds

of nitric acid, and nitrous acid.

- Q. Well, nitrite is a compound of nitrous acid with some base or salt? A. Yes.
- Q. And nitrate is a compound of nitric acid, with some base, or salt? A. Yes.
- Q. That is what I mean. Do you say those combinations occur, and that nitrites, as such, and nitrates, as such, are in the flour?
  - A. I assume that they may be present.

Q. That is your assumption? A. Yes.

Q. Now, I want to ask you what has been the extent—I really don't know whether you answered this or not—what has been the extent of your experimentation with flour bleach-

ed by the Alsop process, if any?

A. My experimentation has been very limited, in extent. It has simply amounted to watching the bleaching process in the mill, and then collecting some of the flour, as it issued from the agitator, and that is all. Then, I collected some of the flour which the miller scraped out of the end of the tube, which had been overbleached, turned yellow.

Q. Over treated?

1231 A. Yes, over treated; and those two samples I took home with me, tested them, but I have not carried out any experiments.

Q. And that does not form the basis of the opinions you have been expressing?

A. No, it does not.

Q. Then, is it fair to say that you have made no experiment, or conducted no investigations with flour bleached by this Alsop process, for the purpose of your testimony in this case, other than what you have just said you saw some?

A. That is fair to say.

Q. Now, would that same answer apply to bread baked from flour that has been bleached by this Alsop process?

A. Yes.

Q. You conducted no personal investigations with bread?

A. I have tested various samples of bread since I have been in Kansas City, with the Griess reagent, to determine whether or not that bread was baked from bleached flour.

Q. Anything else? A. No.

Q. You have not gone into the digestibility, and things of that kind? A. No, I have not.

Q. Then, the extent of your experimentation of bread has been, that you have dropped the Griess reagent on it, to see if it responded for the nitrite test? A. Yes, sir.

Q. Now, I want to ask you, Doctor, a question similar to that I asked Doctor Folin, just to get it in your testimony. Do heat and mass action, including concentration, pressure, and the presence of other substances, all enter into the—most of them—all enter into consideration, when we are considering possible combinations or reactions?

A. They all play a part, yes.

1232 Q. They all play a part? Did you hear Dr. Folin's testimony? A. I did.

Q. Do you agree with him that, if you vary in one of these factors, you may vary the degree or extent, or whatever it may be, of the reaction? A. Yes.

Q. May modify the reaction? A. The extent of it, yes.

Q. Sometimes, it may even change the whole character of the reaction? A. I think that is conceivable.

Q. Well, the illustration I put to Dr. Folin, of adding dilute nitric acid to benzine, and then more concentrated, and then highly concentrated, illustrates that, would it not?

- A. The formation of di-nitro benzine, and so forth, as depending upon the quantity of nitric acid, the temperature, and one thing and another, is true, but you said you got nothing at first, by adding nitric acid to benzoe. I do not agree with you. I think even dilute nitric acid will produce a certain amount of nitro-benzine.
- Q. Now, my information is that, in the dilute form, no compound is formed, whatever, when you add it to benzine?
  - A. That is contrary to Beilstein—our Bible in chemistry.
- Q. Then in the higher concentration, you get dinitrobenzine? A. Yes, sir.

Q. And then, still higher? A. Polynitro.

Q. That would illustrate, where you vary the concentration, you do get an absolutely different chemical reaction?

A. Yes.

- Q. And a different material, as result of the reaction—different compound?
- A. I don't know as you can call it a different chemical 1233 reaction. You get the same chemical processes going on, to a greater degree.

Q. Well, it results in different compounds?

A. It results in various compounds.

Q. Now, is flour a highly complex substance?

A. It is.

Q. And I will ask you, Doctor, with this in mind, we have brought out about the differences in concentration, and the other factors we have referred to as possibly modifying chemical reactions—if a chemist is able to predict what will be the result of bringing any chemical reagent into culmination with an organic compound, with certainty?

A. He is able to predict, to a certain extent, what will happen when nitric acid is brought in contact with a given

chemical compound.

Q. I did not say nitric acid. I say, is a chemist able to predict with certainty what will result with the bringing in contact with an organic compound, some chemical reagent?

A. He is able to do that, within certain limits.

Q. Doesn't it often happen that, theoretically, you can figure out that, by bringing certain things together, you will get a certain compound, or a certain result, and yet, when you try it, you do not get that? Doesn't that often happen in your laboratory experience and with every chemist?

A. That happens when you are working on reactions which are theoretically possible, but which have not been demonstra-

ted, as yet, as taking place.

Q. Yes, that is just what I am dealing with. I did not mean it, in concrete instances. What I mean is, you cannot, a priori, predict what is going to happen, by bringing certain reagents in contact with certain organic compounds?

A. You cannot, in every case, predict it, no.

Q. And, isn't it a truism in chemistry, that there is no such thing as reasoning by analogy?

1234 A. Oh, I beg your pardon. I think that is where we have made our greatest progress in chemistry, from reasoning by analogy.

Q. Well, I happen to have read a whole lot in another case, where that was stated. You do not agree with that, at any

rate? A. No. I do not.

Q. Now, you have described certain effects of nitrites—the flushing of the face, and a whole lot of things, that I don't remember, but whatever they are—what amount of nitrites did you have in mind, if any, as producing those symptoms?

Q. You will get flushing of the face and neck, and fallen

blood pressure, and dizziness, in small medicinal doses.

Q. Well-

A. A grain of sodium nitrite, if you wish to, or, say two or three drops of amyl nitrite, another form in which it is given.

Q. Two or three drops of amyl nitrite, or a grain of sodium

nitrite? A. Yes.

Q. I don't want to make it any stronger than you said—you make it?

A. I think it would, in most cases, but there is a difference in individuals; a great difference in individuals.

Q. Have you experimented with nitrites, to observe the effect on the system? A. Yes.

Q. What is the smallest amount with which you have experimented? A. I don't remember.

Q. Could you help us, by giving us an approximation?

Would it be a half grain, or a quarter of a grain?

A. Since my work at the time was not with the purpose to find out how small a dose would give a reaction, I did not pay any attention to that.

Q. Certainly not.

A. My work was simply to determine, in the Phar-1235 macology Institute in Strasburg—to demonstrate to a class of students the reaction of nitrites when given to animals, and I do not remember the doses.

Q. You would not remember the smallest amount with which you experimented, where you got any observable symp-

toms?

A. I would not remember that. If I gave you any amounts,

it would be mere guesswork, and of no value.

Q. You could not say whether it was less than a half a grain, or a quarter of a grain, or within any range like that? I would not want to tie you down to any figure, if you cannot remember.

A. I cannot say, because those experiments were with an

entirely different purpose in view.

Q. Well, I will ask you this: Isn't it true that, so far as you have testified as to the possible effect of these—shall we say "unweighable" amounts of nitrites, or minute amounts of nitrites, or traces of nitrites, however you may denominate it—your testimony as to the possible effect of those was based on your knowledge of the effect produced by considerable doses—enough to produce observable effects?

A. By larger amounts.

Q. And you deduced from that, that these minute amounts will produce the same effect, differing in degree?

A. Differing in degree, ves.

Q. That is fair to say, that that is a deduction from your knowledge of the action of the larger amount? A. Yes, sir.

Q. Also,—I do not want to misquote you,—but I will ask you—did you say that methemoglobin might be produced, but be so slight as not to be observable? A. I did.

2. Then, you would have to simply rely upon your general

knowledge that it was there? A. Yes, sir.

1236 Q. You would not be able to say it was there, from actual observation? A. No.

Q. Now, it is well known to gentlemen of your profession that, generally speaking, nitrites will produce methemoglobin in the blood? A. Yes.

Q. That is a well recognized fact? A. Yes.

Q. And, as I understand it, you have added certain concentration—a certain amount of nitrites to the blood, and that illustrates that fact? A. Yes.

Q. That, I believe was blood of an ox? A. Yes.

Q. And the dilution in that particular instance was one to two thousand—one of sodium nitrite to two thousand of blood?

A. It was perhaps a little bit less, because I added a little bit more—because I added the reagent, yes see. I had calculated on a hundred cubic centimeters of blood, but I added 25 cubic centimeters of reagent, so it would be a little less than 100—that is, a little more than one to two thousand. But that is of no consequence.

Q. I understand, you were not testing the minuteness of

it? A. No.

Q. Now, I want to ask you if you are acquainted with this work I have here, entitled "Pharmacology and Therapeutics, of the Action of Drugs", by Cushny? A. I am.

O. Is that a standard work?

A. I think it is the best we have, in English.

Q. Now, I want to read from Page 468, and ask you if you agree with what is stated here. (Reading):

"Amyl nitrite causes the blood to assume a dark, choco-1237 late color, both in the body, and in the test tube. The color is due not to any compound formed by the nitrites, but to their changing the hemoglobin to methemoglobin, and nitric oxide hemoglobin compounds, in which the oxygen is attached much more firmly than is oxyhemoglobin, and which differs from it, in the absorption bands seen in the spectrum. This change in the hemoglobin does not entail the destruction of the red corpuscles, and the compounds are eventually reduced by the tissues, although the reduction progresses much more slowly than that of ordinary oxyhemoglobin. In man, usually very little of the hemoglobin is thus transformed, and, even after large quantities have been inhaled, no abnormal coloration of the blood is noticeable, but it has been demonstrated, recently, that the alteration of the hemoglobin is a cause of death in some animals, through the blood becoming incapable of carrying the oxygen to the tissues."

I direct your attention particularly to the part I have read which states,

"This change in the hemoglobin does not entail the destruction of the red corpuscles, and the compounds are eventually reduced by the tissues, although the reduction progresses much more slowly than that of ordinary oxyhemoglobin. In man, usually very little of the hemoglobin is thus transformed."

And then, later on:

"It has been demonstrated, recently, that the alteration of the hemoglobin is a cause of death in some animals." Mr. Butler: What page is that?

Mr. Elliott: 468.

By Mr. Elliott:

Q. (Offering the book to the witness) I will hand you this, because I am afraid I—

A. (Interrupting) You read it very well, yourself. I will ask you if you agree with what is there stated?

A. I think I can agree fully with what he says. He says it has been found that death in some animals is caused by this. I think it is the cause of death in each instance—that is, in man, as well as in animals.

Q. Then, you would be inclined to disagree with him?

- A. Well, he says some animals. That might include man, for all I know, what he means. It is the cause also of the death in man. I would simply add that, perhaps, to his statement.
- Q. Well, do you agree with this statement (reading): "In man, usually very little of the hemoglobin is thus transformed, and, even after large quantities have been inhaled, no abnormal coloration of the blood is noticeable."

A. Yes. Notice, Mr. Elliott, he says no abnormal coloration of the blood is noticeable.

Q. Yes.

A. He does not say that the change of the blood is not noticeable by the spectroscope.

Q. No. I am just reading exactly what he said.

A. He means what is called "microscopically noticeable". That is, by drawing the blood, it would not look very much different from the ordinary, or by looking at the person, perhaps.

Q. But it is true that, 'In man, usually very little of the hemoglobin is thus transformed, and, even after large quantities have been inhaled, no abnormal coloration of the blood is noticeable." He does not say whether by the spectroscope, or anything else. A. I did not get that.

Q. I will show you that (handing the witness a book).

A. No, I do not agree, at all, with that. I misunderstood your reading. No, I misunderstood you. I think
he is quite wrong, in the light of more recent works on
that. I think, in man, the formation of methemoglobin is as
pronounced as it is in any animal. Now, Mr. Elliott, I understood you to mean—I understood it, when you read it, that, in
man, very little of the methemoglobin is transformed back into
hemoglobin. You see? I did not understand.

Q. I was not trying to put anything of my own into that. I simply wanted to read what this gentleman said, and ask you

if you agreed with him.

A. No, I do not agree with him, there.

Q. Now, while we are on this subject, do you remember giving a deposition? A. I do.

Q. And you were asked, I believe:

"Do you know of any case of chronic poisoning from an inorganic nitrite,—sodium nitrite, for instance", and you answered: No, I do not, personally." Is that correct?

A. That is correct.

Q. And you were again asked: "Do you know of any, in the literature?" and you answered: "No, I know of acute cases, but not chronic cases." Is that correct?

A. That is true.

Q. And then you were again asked: "But, so far as you know, also, such a thing as chronic nitrite poisoning—that is, of an inorganic nitrite,—has never been heard of, and no case has ever been recorded. That is true, isn't it?" and you answered, "As far as I can recollect, I don't know of any case". Is that correct?

Mr. Butler: I think that line of cross-examination is not admissible, or proper, unless his testimony, here, be different from that claimed to have been given elsewhere, and I don't understand that Mr. Elliott even claims that he testified differently.

Mr. Elliott: Why, absolutely not. I just did it to put it briefly.

Mr. Butler: Well, why don't you just ask the questions? It don't make any difference what he testified elsewhere. Just ask for the facts.

The Court: Well, go on, within reasonable limits.

Mr. Elliott: That is all, on that.

Q. Now, I understood you to say, also Doctor, that nitrates are deleterious in their action on the human organism? Is that correct? A. They are.

Q. And yet, I believe it is true, is it not, that nitrates occur very generally in plants, and vegetables that we eat—per-

haps other things? A. Yes.

Q. And whatever may be said about nitrites, it inevitably occurs that we must eat nitrates, doesn't it? A. Yes.

O. That is certain? A. I think so.

Q. Now, as to the possible harm from these small amounts of nitrites—I don't want to go into this in detail, but I will just ask you to assume that they occur in the air, and in the water, and in certain vegetables, and in smoked meat, and cured meat, and in the saliva. Just assume that, irrespective

of whether it is true, or not. I will ask you, would your opinion that you have expressed, that they must inevitably be harmful in certain degree, be modified in any way, by considerations of the body becoming tolerant, or immune to these minute amounts?

A. No. That does not alter my opinion.

1241 Q. And do you deny that the body is prepared to handle these varying amounts of nitrites, such as are contained in the saliva? A. I do.

Q. Do you deny that those nitrates may oxidize-

Mr. Butler: Nitrates?

By Mr. Elliott:

Nitrites may oxidize to nitrates, and pass out of the body readily?

A. That I am inclined to doubt, very strongly. I think the

te lency is the other way.

Q. I wish to call your attention to this sentence, from page 469 of the same book I referred to in a previous question, under the heading, "Nitrites of potassium and sodium", and ask you if you agree with this statement. (Reading) "The nitrite absorbed is excreted as nitrate in the urine, although some of it may remain unoxidized". Do you agree with that?

A. I agree with that. But that is after the nitrite has done

its harm.

The Court: How is that?

A. That is after the nitrite has worked its harm in the system, that it is finally excreted as nitrate.

By Mr. Elliott:

Q. That is your idea about that?

A. There is no doubt of that.

Q. Well, at any rate, you agree with that statement?

A. That is the mode in which they are finally excreted from the body.

Q. Are you acquainted with this book, "A text-book of physiological chemistry", by Hammerstein? A. I am.

Q. Is that a standard work?

A. It depends upon the edit

It depends upon the edition.
Q. Well, it is Mandel? A. What is the date?

1242 Q. It is an authorized translation by John A. Mandel, 5th edition, 1909. A. Yes.

Q. Page 204.—No, let me read back just a little further, 203, this is.

Mr. Butler: Give the name of that book will you, Mr. Elliott?

Mr. Elliott: "A text-book of physiological chemistry", by Hammerstein, page 203.

The Witness: Pardon me—the English translation of the book.

Mr. Elliott: Yes, by Mandel.

Q. At the bottom of page 203: (Reading) "Met-hemoglobin does not contain any oxygen in molecular or dissociable combinations, but still the oxygen seems to be of importance in the formation of met-hemoglobin, because it is formed from oxyhemoglobin, and not from hemoglobin, in the presence of oxygen, or oxidizing agents. If arterial blood be sealed up in a tube, it gradually consumes its oxygen, and becomes venous, and by this absorption of oxygen, a little met-hemoglobin is formed." That is, as I understand it, after the addition of anything. "The same occurs on the addition of a small quantity of acid to the blood." Do you agree with that?

A. Some acids will do it; yes.

Q. He did not specify. This says "small quantity of acid". I assume he means any acid. "By the spontaneous decomposition of blood, some met-hemoglobin is formed, and by the action of ozone, potassium permanganate, potassium ferricyanide, chlorates, nitrites, nitro-benzin, pyrogallol, pyrocatechin, acetanilid, and certain other bodies on the blood, an abundant formation of met-hemoglobin takes place", and I direct your particular attention to the ozone, and ask if you agree with

that? A. Yes.

1243 Q. That that produces or may produce met-hemoglobin in the blood? A. Yes.

Q. Now, knowing all about these nitro compounds, whether or not they would be formed would depend, Doctor, would it

not, upon the concentration of the reagent used?

A. I think, Mr. Elliott, that we would have a formation of nitro compounds from the proteid in the flour, with the smallest possible amount of nitric acid present. That is to say, with only a molecule acting upon the flour, we would have a molecule, or an equivalent amount of these nitro compounds formed.

Q. All right, now,—I am not going to quarrel with you for a minute. I just want to get your answer. If I understand it, it is that with any specific dilution of nitric acid, there would be nitro compounds formed in flour? A. Yes.

Q. All right. That is perfectly clear. Have you made any study of nitro compounds—special study? A. Yes.

Q. Have you formed them, yourself?

A. Yes. I published a reprint—I published an article on research on the nitro compounds and derivatives of these that are formed by the action of nitric acid, on what we call anisol, which is the substance contained in the oil of anise. This

anisol is a meth-oxy-benzoe, and when treated with nitric acid, it is converted into trinitro-meth-oxy-benzol, which is the methyl ether, or methyl iodide—methyl, with ether or picric acid.

Q. Now, what dilutions of nitric acid, Doctor, have you

worked with? A. In that case?

Q. Yes.

A. I can't tell you. I can get the reprint for you.

Q. Did you use dilute nitric acid?

A. No. I used concentrated, because I wanted a large amount of product.

1244 Q. Would you be able to tell us the smallest dilution with which you have worked, in producing any nitro

compound?

A. I would not be able to tell you, for the simple reason that I was not trying to get the smallest amount. I was trying to get the largest amount.

Q. Now, how far, then, does your statement that the most dilute form of nitric acid will produce a nitro compound—how

far is that based on theoretical considerations?

A. Why, that is based on statements which are to be found in the literature—statements of Beilstein,—in our Bible, as I said before—our chemical Bible, or book we go by. Beilstein.

Q. What is the name of the book?

A. Beilstein's Handbook of Organic Chemistry. It is a book in which all the chemical substances known are listed, and the methods of their formation is there given, and their purposes are stated.

2. You are not able to tell us, however, the dilutions you

have used in any nitro compound you have formed?

A. No.

Q. Now, I think you say you had seen one case of nitrite poisoning? A. Yes.

Q. Was that the case you told me about, once before?

A. Yes.

Q. Of amly nitrite? A. Yes.

Q. And that is an organic nitrite, is it not? A. Yes. Q. And one that we just read about, that you inhale?

A. Yes.

Q. Now, you said there were twelve or more in the literature—can you tell us something about those—what they were?

A. These cases that I have reference to were collected and published by Carl Beck, of Chicago, an eminent clinician, and they were, for the greater part, cases of nitrite poison-

ing which resulted from the medicinal administration of bismuth subnitrate. They were fatal in a number of cases, in children, and in every case met-hemoglobinemia was very pronounced. Methemoglobinemia was very pronounced.

Methemoglobinemia means the condition of the blood where the oxyhemoglobin is not there as such, but you have methemoglobin instead. I said before that children were particularly susceptible to nitrite poisoning, and that is especially true when they are given nitrates, because in the intestine of children, there seem to be a large variety-a larger number of bacteria, which convert the nitrate into the nitrite, than there are in the intestine of grown-up persons.

Q. Now, these cases, as you have stated, were the cases of

the administration of subnitrate of bismuth?

Yes. A.

Q. Bismuth subnitrate? A. Yes.

Q. And, for that purpose, I presume it was in connection

with the use of the x-ray apparatus?

No. It was in order to stop diarrhea, and the subnitrate of bismuth had been given in doses of four or five grains.

That was the subnitrate of bismuth?

A. Subnitrate of bismuth; yes.

Now as to the nitrites in the saliva. You have expressed the view, I believe, that they are not normal? A. I do.

Let us see if we understand each other. Do you mean by that that it doesn't follow that they inevitably occur in the average human being's mouth?

A. It all depends upon what you mean by the word "nor-

mal".

Well, I will explain. Now, as we live, ordinarily, and Q. have lived, isn't it true that there are bacteria in the mouth?

Yes. A.

- Q. And these bacteria produce nitrites in A. Yes. 1246 mouth?
- Q. Whether or not the nitrites are in the gland, or nitrates are in the gland, or not?

A.

Q. It must follow, then, that whether the nitrites or nitrates are in the glands, they are in the saliva, as it is swallowed? A. Yes.

And must be there? A. Yes.

Now, that is what I mean by being there normally. That is, we must inevitably swallow them?

Well, may I answer-

- Yes, but just let me ask you one question. Now, you have stated that you rinsed your mouth out with some antiseptic, or something of that kind, and you didn't get the nitrites?
- A. I said I did it, myself, as you remember. I rinsed out my mouth with dilute alcohol, and with normal salt solution, as we call it, repeatedly, until finally a specimen of saliva which I obtained did not give the nitrite reaction.

Q. But before you did all that, you got the nitrite reaction?

A. Yes. It wasn't very strong, because I usually try to keep my mouth very clean.

Q. I haven't the sligtest doubt of it.

A. But I did get a nitrite reaction. But, if you will allow me, I would like to say something about the word "normal", as you asked me.

Q. Well, I don't want it. I think we understand each

other.

Mr. Butler: Let him explain.

By Mr. Elliott:

Q. Well, go ahead.

A. It is very difficult to say what is "normal", and what is casual, or usual. Now, in the saliva of almost every person, you will find the organisms that produce pneumonia-the pneumonia cocci,-but I wouldn't call their presence, there,

"normal", because it is due to their presence in saliva that we have pneumonia. They seize upon the organism when its resistance is reduced, and we get

our infection with pneumonia.

Q. In lots of them they don't do that?

That is very hard to say. You may have had a slight attack of pneumonia, when you didn't know it. Then, there is another point I would like to make, and that is this: The vast majority of all people who come to autopsy-that is, to post-mortem examination, show, whether through sickness, or accident-show signs of tuberculosis, at some time or other in life. You wouldn't call the tuberculosis a normal thing in a human being, would you?

Q. I am sure I don't know. I will let you call it anything

you want to.

A. But it is very usual.

You understand what I mean by "normal"?

Yes; it occurs frequently; that it occurs in the ordinary human being.

It inevitably occurs in the ordinary human being? Q.

A.

That is what I mean by "normal".

That's not "normal". I think normal would be the human being in his best possible condition of health. You are not living in the best possible conditions of health.

Q. All right, but take the human being as we have it.

Yes. That is usual, but not normal.

All right; that is what I mean. Now, there are a great many-outside of this question of nitrites, or any poisonous compound,-there are a great many foods that are not suitable for all kinds of people, are there not? A. Oh, yes.

- Q. You couldn't feed a baby on the same thing you could feed a grown man? That is true, is it not?
  - A. It would depend on the age of the baby.

Q. An infant.

A. What is the definition of an infant?

1248 Q. A nursing baby. A. Under two years?

Well, say two months. A. No, you could not.

And you couldn't feed an invalid, or sick person, or with typhoid fever, or any kindred disease,-you couldn't feed them the same as a normal person? A. No.

Q. Still, that fact would not say that the food was wrong,

would it?

- It wouldn't mean that the food, as such, contained deleterious substances.
  - No, I say, apart from all of that,-just taking the food.

A. No, it wouldn't mean that the food was wrong.

Just the fact that all persons can't eat the same food, doesn't mean that the food is not perfectly good?

No. it does not.

Mr. Elliott: I believe that is all.

## Redirect Examination

By Mr. Butler:

Q. As I understand it, when you were out here at the mill, you saw the specimens of gas taken by Dr. Hulett in the flask, which he reported in his testimony as 300 parts to the million? A. I did; yes.

Q. And you also saw the specimen taken by Doctor Acree in his flask, which he reported as 1,000 parts to the million-

1,100, I believe. 1100 parts?

I did. A.

Now, there was difference of degree of color? Q.

There was difference; yes. A.

Now, was it necessary to put that taken by Acree against Q. a white backbround, and compare it with something?

No. It was very distinct, any place. While it was 1249 being collected, as well as after, there was a pronounced yellowish brown color.

And was this generator where the flaming are takes

place, in such shape that you could look into it?

A. Yes.

Was there a glass, or something? Q.

There was a little glass in front-sort of a box in which this discharge takes place.

O. And I understood you to say to Mr. Elliott that you believed you could see that?

A. I certainly did believe I could see the gas being formed in it.

Q. Right where it was made? A. Yes.

Q. Now, as I caught the substance of your answer to Mr. Elliott, when he asked you, I believe, what happened when this gas came in contact with the flour, and you stated it was the formation of nitric acid and the nitrous acid, and that you know nitro compounds are formed, and that you believed nitrites and nitrates were also present? A. Yes.

Q. Now, as to the distinction about that. What is the

nitro compound? Is that organic?

A. That is organic; yes.

Q. That is a combination of the acid with the protein, for example?

A. It is a compound resulting from the action of nitric acid

upon the protein molecule.

Q. And that might be called a nitrate, if it is nitric acid,

of a protein, or-

- A. No, it could not be called a nitrate, possibly, of the protein.
  - Q. It would be called a nitro compound?
    A. It differs entirely from the nitrite.
- Q. And, in the case of the addition of nitrous acid, the action of nitrous acid upon the protein—what would that be called—a nitro compound, too?

A. You would probably get a nitroso compound, in that

case.

1250

- Q. Now, assuming there is some sodium salt—dilute quantities sodium, or potassium, or magnesium,—in the flour,—combined with those bases it would be nitrates, and nitrites?
  - A. Yes.
  - Q. Depending upon which acid was used?

A. Inorganic salts; yes.

Q. The nitrous acid, itself, may be regarded as a combination of the NO2 and hydrogen? A. Yes.

Q. And a nitrite of hydrogen? A. Yes.

Q. NO2, and the nitrite reacting material is in material that will respond to this Griess test, as I understand it?

A. Yes.

Q. Whether it be the gas, itself, or the gas in solution, or nitrous acid? A. Yes.

Q. The nitric acid does not respond to that test.

A. No. It does not.

Q. So that that test would not indicate the amount or volume or character of the nitro compounds, which you characterized as the most notorious organic poisons?

A. It would give absolutely no indication of their presence. I didn't call them the most notorious, but among the most

notorious,

Mr. Helm: What do you mean by the word "notorious"?

The Witness: Well-known, Mr. Helm.

By Mr. Butler:

Q. And question was raised, again, whether or not dilute nitric acid, acting upon benzin, would produce any reaction, and my understanding was you said it produced a nitro-benzin, to some extent, at least?

a. That is my understanding.

Q. And you referred to authority on that question?

A. Yes.

Q. Now, is that fact well understood by chemists?

A. I think it is.

Q. I intended to ask you, in my direct questions, as to the stability of this color, after the moisture and vapors of the bread has been condensed and the Griess test applied. Were you here when that test was made in the Court? A. I was.

Q. And are you able to glance at that tube, now, and tell us whether or not the color is as strong, now, as it was when the reaction was applied? A. No. It has faded a great deal.

Q. What is the explanation of that?

A. The azo-dye that is formed is a very unstable substance. That means a substance that easily goes to pieces. That is, it is easily broken up, and it keeps only a very short time. Very soon after this formation, it begins to disintegrate, and go to pieces, and that is what happened in this case.

Q. And would that be so, where the test was applied to or-

ganic material, like biscuits, etc., containing nitrites?

A. Yes, sir.

Q. The action of light and air, etc., works further changes,

which destroys the value of the test? A. Yes.

Q. Mr. Elliott asked you whether or not you did not agree with him, that in chemistry, reasoning by analogy must be barred. I understood you to say that you did not so agree?

A. No. I do not.

Q. Why not? What is the rule among chemists, in that regard?

1252 A. I think that is how most of our information is obtained. I will give an example. There are those chemical compounds that we know may be formed, yet we have never undertaken to form them. We simply know that they must be formed, because of analogy, and that is, we don't waste our time preparing those substances, unless they have a particular value in themselves; but we know perfectly well that any one of these, possibly, will be there, from the fact that certain substances, chemically well defined, are formed under certain circumstances. Therefore, we know that any number of that group—almost, can be formed under similar conditions, and that is reasoning by analogy; and it is because we know cer-

tain fundamental reactions, that we try others, when we want to get other new compounds, and I think reasoning by analogy is one of the most important things in chemistry. I think most of our laws in chemistry are based on analogy, to certain extent.

Q. Now, something was said about the dose of nitrites. I understood you to refer to one grain of sodium nitrite as a small medicinal dose?

A. Yes, Sodium nitrite is a medicinal dose. I think it is about the right one. It is not a small one. It is the medium dose.

Q. Now, you referred to two or three drops only of the amyl nitrites being a dose? A. Yes.

Q. Now, the sodium nitrite is inorganic?

A. Inorganic: ves.

Q. And the amyl is organic? A. Organic nitrites; yes.

Q. Were you here when Doctor Kempster testified?

A. I was not. I was in St. Louis.

Q. Is amyl nitrite given by inhalation? A. It is.

Q. Now, you also spoke of the difference in persons, as to the effect of a given quantity of this. Does that differ even in adults, or are adults able to endure a dose of these 1253 nitrites more than others?

A. Oh, yes.—I don't know as I got your question.

Q. You have made reference, in your conversation during the cross-examination of Mr. Elliott, to a difference in persons, as respects dose? A. Yes.

Q. And effect from dose?

A. Yes. Some people are much more sensitive to the action of nitrites, than others. I may give as an example, these facts. If you give a person pearl of amyl nitrite—I showed you some.

Q. Have you it?

I don't know what I did with it. This amyl nitrite comes in little glass pearls, and when the person wishing to use the drug has need for it, he crushes one of these pearls in his handkerchief, and inhales the fumes. I used to demonstrate the action of the nitrite, to a certain extent, on myself, because I am very sensitive to that action. It produces on me flushing of the face, and in some people, -in others, it isn't nearly so apparent. -this flushing of the face, and light people are more apt to be good subjects to show the flushing of the face, than people with dark complexions, because the skin is usually light; but, outside of that, there is a difference in degree, also, and the flushing in different people, and some people are made dizzy by as little as three drops, amyl nitrite, while others are not affected to that extent. That is, although they feel the beating of the blood in the temporal arteries, their thoughts are not in any way disturbed. That is, they don't feel this sense of dizziness

or giddiness, that others do. So, there is a decided difference to be seen, there, in different medicinal doses, in different individuals.

Q. Now, in speaking of the immunity to small amounts of these nitrite reacting material, Mr. Elliott used the expressions "very minute", "unweighable", and "a trace". Now, you saw this test for nitrite reacting material, in this fluid con-

densed from the bread, at the time the test was made here

in the court room, did you? A. Yes.

Q. Now, tell us whether or not that could properly be described as a mere trace of nitrite, or whether or not it was measurable quantity, by means provided by chemists, or known to chemists, rather, for the measuring of it?

A. It was a measurable quantity of nitrite.

Q. And, that the record may show some expression of the degree of that color, because it is unstable—about what color was it, as compared with some article more or less familiar?

A. It looked something like pink lemonade.

Q. A distinct pink? A. Yes.

1254

- Q. Not as dark as the ordinary—I don't know whether it is sold as much now as it used to be—tincture of arnica, that they sell in the drug stores for bathing bruises, and such things as that?
- A. I don't remember that tincture. I have never used it. Q. As dark as a light-colored beer? It has a slightly different color from the beer, I would take it.

A. I don't see how you could compare it to beer.

Q. My observation of color is very inaccurate. I am, like Mr. Elliott, somewhat color-blind, though not totally so.

- Q. Now, as to the effect of minute quantities, such as would be in bread like this, made from bleached flour like this. You told Mr. Elliott, as I understood you, that the effect would be produced in the hemoglobin of the blood, so minute as not to be observable? A. Yes,
- Q. Now, what was intended to be conveyed by that—observable how?

A. By looking at the person—by looking at the patient's 1255 blood, even by examination of the patient's blood with the spectroscope, which is very much more sensitive than the naked eye for the detection of methemoglobin, but which, after all, is not sensitive enough to detect very small quantities of methemoglobin.

Q. Now, your attention was called to certain statements on page 468 and 469 of Cushny's pharmacology and therapeutics, or the action of drugs. You did not ask for the date of this edition, and I don't know whether that would make any difference but I believe it is shown somewhere on the title page that

this is the fourth edition, 'thoroughly revised and illustrated with 52 engravings." What is the last date of this?

Mr. Butler: Did you observe, Mr. Elliott?

Mr. Elliott: No, I did not.

By Mr. Butler:

Q. I believe this is copy-righted 1906. Do you know whether this is the latest edition, or not?

A. I don't know. There has been a recent edition of Cushny.

I don't know how recent.

Q. Can you tell by looking at this?

A. I don't know. I have the 1906 edition.

Q. That bears a copyright mark of 1906, but the preface is dated 1899.

A. I think that is probably the first edition.

Q. No, it says here, "fourth edition".

A. Oh, 4th edition, thoroughly revised. I don't know the date of it.

Q. Well, I don't know that it makes any difference.

A. It don't seem to give any date.

Q. You expressed the opinion, notwithstanding anything that was said here, if there was anything to the contrary, that the change of the hemoglobin to met-hemoglobin may kill hu-

man beings—may kill man, I think you said? A. Yes. 1256 Q. Then, you spoke of chronic and acute nitrite poison-

ing. What is the difference between chronic and acute?

A. Chronic poisoning would be one that would be due to a long-continued administration of small doses, the individual effect of each dose being small, but these effects following so frequently that finally the organism shows poisoning, in consequence of the frequent administration of the drug in small doses. That is to say the organism has not had quite time enough to recover from one small dose, before the next one is superimposed upon it, and in that way, little by little, the resistance is overcome, and you get evidence of poisoning. That is what we call chronic poisoning.

Q. What effect does it have as compared with asphyxiation?

A. It is practically the same process. Asphyxiation is due

to the fact that the blood cannot take up oxygen.

Q. Now, how is it that a large dose of these nitrites will produce the same effect or appearances as will partial asphyxiation—not to death, but injurious asphyxiation, by inhaling gas, for instance, if the gas would be permitted to run in a room where a person is. How does it happen it produces the same effect?

A. Well, the inhalation of illuminating gas, do you mean?

Q. Yes.

A. Illuminating gas contains a chemical substance known as carbon monoxide, and carbon monoxide forms a compound with the blood which is called carbon-monoxide-hemoglobin, and this carbon-monoxide-hemoglobin, like met-hemoglobin, doesn't take up oxygen, and, therefore, of course, it isn't passed on to the tissues, and you would get very similar effects from illuminating gas poisoning, that you would from met hemoglobin formation in the blood. There is a difference, however. Carbon monoxide hemoglobin is a distinct compound of hemoglobin with carbon monoxide, whereas met-hemoglobin is a substance which can be formed, as you heard Mr. Elliott reading to you,—which can be formed by the action of a variety of

substances upon the blood, including nitrites, nitrobenzoe, potassium ferricyanide, ozone, chlorates, etc., whereas carbon-monoxide-hemoglobin is formed by only

one substance-by carbon monoxide.

Q. Now, what is the character of these other substances, in which company we find these nitrites, that produce met-hemoglobin? I want to find out, here, what kind of company it is

keeping in the books.

A. It is very difficult. We know practically nothing about the character of the met-hemoglobin formation, because that list includes substances which we call oxidizing agents, like ozone, potassium chlorate, and substances which we call reducting agents, like potassium ferricyanide—that is, substances which, in their chemical behavior, would tend to be rather opposite. On that account, we have practically no explanation, today, how this reaction takes place. We simply know the fact that it does occur.

Q. It mentions ozone, potassium permanganate, potassium ferricyanide, chlorates, nitrites, nitro-benzin, pyro-gallol, and

here's one I [can] pronounce. A. Catechin?

Q. Phyrocatechin, acetanilid, and certain other bodies on the blood, an abundant formation of met-hemoglobin takes place.

A. Yes.

Q. Now, this man Hammerstein, translated by Mandel, indicates, as I take it from this statement that Mr. Elliott read, that abundant formation of met-hemoglobin takes place?

A. Yes.

Q. Is that the understanding? A. Yes.

Q. As applicable to man, as well as the lower animals?
 A. Yes, I would like to say, in explanation, the most fre-

quent cases of nitrite poisoning have occurred within the last few years,—that is, recognized,—practically, and I think 1258 that is why Cushny has that remark. I think he wrote that manuscript before he had had access to these more re-

cent cases which show very clearly that met-hemoglobinemia is very pronounced in human beings. The cases of Carl Beck show that,—the cases which were published here, in Chicago, this year.

Q. On what do you base your opinion, stated to Mr. Elliott that such nitrites as may be found in the air, and so on, without speaking about the lower animals, the human system does not become immune or tolerant of the results to be ex-

pected, or ordinarily produced?

A. When you come to the subject of immunity, you have struck the very most difficult one of modern biological science, almost, and it is very difficult to say what you mean by immune. I suppose "immune", the way Mr. Elliott used it, meant that that same substance, nitrites, or nitrous acid, would not exhibit, after while the symptoms for which it is known, by which it is characterized; but I will say this, that, because a substance does not exhibit those characteristic symptoms after a while, it is not to be said that that substance is not producing great harm. May I give an example?

Q. Yes, certainly.

A. This is an example I gave in Boston. It is well known,—the best known method—the best known example of producing immunity, artificially, is one with which you are all of you more or less familiar. It is the producing of immunity in the horse to diptheria, with the end in view to produce a serum which may be used on human beings, as an anti body to the disease, and the toxins produced by the bacteria in our system. The way this immunity is produced in the horse is by means of an injection into his blood, or subcutaneously,—it is done both ways,—of a culture of diptheria organisms—that

is, the little bacilli that produce diptheria. of this injection, we produce in that horse a mild form of diptheria, but after a while, he recovers, because, to begin with, the disease is not as effective in the horse as it is He is then given another dose. He has another attack of diptheria, milder than the first. That is, he may not eat his feed for a day or two, and he may have temperature, and he is given further doses until finally he shows absolutely no reactions to the organisms of diptheria. We then call that horse "immune", to the bacillus of diptheria, and he is immune as far as the disease which we call diptheria is concerned; and then his blood is drawn, and his blood is used to make what we call anti-toxin, to be used on human beings in the treatment of diptheria. That horse is immune to diptheria, but it is just a question of time before that horse will die with what we call mucoid degeneration of the liver. Some of them die of it in 6 months, others 8 months, others in a year. The horses have all to be killed, because they get sick. don't have diptheria, but the toxin is working damage, in some way, and we don't know to what extent the immunity acquired carries with it absolute freedom from harm, so far as that substance is concerned.

Q. Now, is there anything known to your profession, any way known by which the nitrites, of the kind we are talking about, in this bread, made from bleached flour, become harmless, by reason of any immunity, or toleration, or anything of that kind?

A. There is no way known, to my knowledge.

Q. You said that sometimes these nitrites—I think attention was called to the fact by Mr. Elliott in one of these books, that nitrites are sometimes eliminated through the urine and you answered that, when finally eliminated, that was after the harm had been done. A. Yes, sir.

2. Now, is that simply an illustration of a truth that ap-

plies to other poisons? A. Yes.

1260 Q. For example, are there other poisons which are poisoncus, and known to be so by every one, which are eliminated? A. May I explain?

Q. Yes.

A. In order that a poison may exert its action upon the human organism, that poison must be,—unless it is a local poison. I mean by this, a poison which is acting constitutionally, that poison must be circulating in the blood, and if it circulates in the blood as such, it is bound to produce this poisonous effect. When it has produced this effect, provided the organism overcomes that effect, then the substance is excreted in the urine. In other words, everything that is found in the urine, has, at one time, been circulating in the blood. If we find nitrites in the urine, then there may have been nitrates in the blood, from which these nitrites were formed. That is to say, the nitrates were formed after the nitrites had exhibited their characteristic reaction, circulating in the blood of the individual. That is what I mean by that.

Q. Now, the suggestion was made that perhaps, in the process of digestion, these nitrites might be changed to nitrates, and that the nitrates might be harmless, and you made answer, as I caught your answer, that the probability was greater that

nitrates will become nitrites? A. Yes, sir.

Q. And become injurious? A. Yes, sir.

Q. How does that happen?

A. The processes which begin to act in the intestinal tract are rather in the opposite direction. They are bacterial processes, to a certain extent, and especially the bacteria which reduce nitrates to nitrites are very commonly found in the intestinal tract. In fact, they are in the intestine of every person, and the chance for the formation of nitrates in the in-

testine out of nitrites are practically nil. It is the other 1261 way; that nitrates are transformed into nitrites, and that is how these cases of nitrite poisoning resulting from bismuth subnitrate are to be understood and explained.

Q. Now, in order that there may hereafter arise no controversy about the cases which you have referred to, which were reported by Beck, in Chicago, how is it known that it was not the bismuth that did the killing, or poisoning, instead of the nitrite?

A. There are a certain number of cases where the poisoning was due to the bismuth. When the bismuth salt was taken in all those cases you get the very characteristic picture of bismuth poisoning; and, in nitrites poisoning, in the other cases, again, we get the picture of both the bismuth and the nitrite poisoning. In the third class of cases, and those are the only ones to which I have referred, we obtain the picture of the nitrite poisoning. If there has been bismuth poisoning at the same time, you would be able to find the viscera. That is to say, in the liver, in the blood, in other organs. If you find no bismuth in the liver, none in the blood, none in the kidneys, none in the spleen, or other organs, then you can safely say that that patient did not die of bismuth poisoning. But, if he showed the characteristic signs of met-hemoglobin, you would know he died of nitrite poisoning.

Q. So that observers would readily distinguish between the two?

A. Yes. Bismuth poisoning is very observable. The mucous membrane of the mouth is turned black. The entire testinal tract is black, due to the formation of the sulphide of bismuth after absorption, and you may get enormous sloughs of the intestinal tract, called mucous membrance sloughs, and all that sort of thing.

Q. Mr. Elliott brought it out that children were particularly susceptible to the effects of nitrites, I think? A. Yes.

Q. Why is that? A. That is a very peculiar thing-

Mr. Elliott: I beg your pardon. I never developed any such thing.

1262 Mr. Butler: Yes, in answer to one of your questions, you brought it out that children were particularly susceptible to the action of nitrites.

Mr. Elliott: Oh, the witness may have said that. I didn't know anything about that.

Mr. Butler: I said you brought it out.

The Court: Proceed.

A. I meant that particularly about nitrite poisoning, from the taking of nitrates. Most of the fatal cases which are in the reports, are in children, and that fact-that peculiar fact led them to investigate to find out if the stools or intestinal contents of children differed in any way in their reaction towards bismuth subnitrate, from the stools of grown persons, and it was found that, if to a tube or any container which contained bismuth subnitrate, a quantity of a child's stool was added, there was formed a very large amount of nitrites, which were easily detectable by the reaction. It the stool of a grown person was taken, the amount formed was perhaps one-fifth, or one-sixth, or even less, as much. There seemed to be present in the child's intestine a peculiar form of the bacillus colli communis, as we call it, which is very much more active in producing nitrites than that which lives in the intestine of grown persons; so that nitrates given to children show a much greater tendency to produce nitrites, and consequent absorption, with poisoning, than in grown persons.

Q. One further question. In your opinion, would it be possible for anyone to develop such immunity from poisoning by nitrites that the hemoglobin would not be changed to the

met-hemoglobin?

A. I cannot conceive of the possibility; no, sir.

Q. What is the character of the action,-chemically?

A. Pardon?

Q. Is the character of the action of nitrite upon the blood, a chemical action? A. It is a pure chemical action.

1263 A Juror: Doctor, poison oak, and poison ivy, and mushrooms,—what kind of a one is that—what kind of

a poison?

Well, Doctor Acree, one of the witnesses in this case, has done a great deal of work around the poison oak and poison ivv and knows more about it than I do; but I can tell you a good deal about the poison of the mushroom. The best known mushroom poison is that which is contained in the so-called agarious muscarin,-the "fly mushroom",-which is not very common in these parts. It is a mushroom with a red hood-a very bright, red hood. The poison which is contained in this mushroom belongs to the same class, pharmacologically,-that is, in its action,—as nicotine, and pilocarpin. Those three—pilocarpin, nicotine, and the poison of the mushroom, called muscarin-vou see, the Latin name is agarious muscarius. so they call it "muscarin"; muscarin, nicotine, and philocarpin—those three drugs belong to the same class of poisons. They are not exactly alkaloidal in their nature. They are not alkaloids.

Mr. Scarritt: What did you say about pilocarpin?

The Witness: Pilocarpin?

Mr. Scarritt: What is that?

The Witness: That is a poison that is contained in Jaborandi leaves. I don't know where they are gathered or where they come from.

Mr. Scarritt: That is a fatal poison?

The Witness: Pilocarpin?

Mr. Scarritt: Yes.

The Witness: It depends upon the dose. It produces profuse sweating. I was going to tell you about the action, if you wanted to hear about how these poisons act. Pilocarpin is a poison which is sometimes given to people with kidney disease, to make them sweat profusely. It does do that, and it also increases enormously the salivary secretion so that a man may secrete a quart or more

of saliva in a very few hours. And this muscarin acts 1264 exactly the same way. These three drugs, muscarin, nicotine, and pilocarpin, act all the same way, in kind, only varying in degree; all have one kind of action, coming first or last. You may sweat first with the pilocarpin, and you may sweat last with the muscarin, but they all have the same series of action. If muscarin is given to a cat, under the skin, that cat will vomit, and it will urinate, and have diarrhea. Then, it will lie over on its side, and its eyes-the pupils of its eyes become like pin points; his respiration becomes very labored; his heart very rapid, because there is the same inhibition; there is the same paralysis of the nerve which controls the slowness of our heart; and, if he is left to himself, he will die very quickly from a very tiny dose. If, however, you give that cat a very small amount-a fraction of a milogram,-for instance, about 1/120th of a grain, if a cat had had only about 1-200th of a grain, or less-perhaps about 1/500th of a grain atropin, he will come to, almost immediately -that is, you can snatch him, as it were, from the very jaws of death. After while, he will raise his head; he will get up, and as a sign of comparative well-being, he will begin to lick himself. That is always a sign of comparative well-being. Now, these others, nicotine and pilocarpin, act very much like that, only you might get the pin-hole pupils first, and the action of the heart last, and so on, but you would have the same series of actions. You all know the effect of nicotine which is produced in young boys when they start to smoke. It is the same with the pilocarpin, only that, first of all, you get very pronounced sweating, before you get your diarrhea, and your vomiting, and your pronounced action on the heart.

By Mr. Elliott:

Q. I just want to ask you one question. You stated to Mr. Butler, that you considered the nitrite reacting material that was indicated in there, to be measurable. Now, I will ask you how you would measure that? Did you refer to 1265 comparing the colors? A. Yes.

Mr. Butler: I meant by the color.

The Witness: That is an analytical method in which we measure a quantity of nitrite. Our method of analysis include the color meter to compare with the standard color, methods of weighing, and methods of computing, and goes by the quantity we get in cubic centimeters, and all that sort of thing.

By Mr. Elliott:

Q. I just wanted to make that clear, that by measuring, you mean you simply compared the color with a known standard?

With a known standard; yes. Now, with your per-A. mission, I would like to say something about another poisonous mushroom, which is the most dangerous one in these parts of the country, and not generally recognized. amanita muscaria-beautiful, white mushroom, and around the roots of the mushrooms are white gills—perfectly white gills. That is a mushroom that has caused more damage than any other, because it looks something like our field mushroom, which is one of the very best—the agarious compostris, but that differs from it in the fact that they have pink gills and not white gills and doesn't grow in such a pronounced bulb. There is no way of saving a person who is poisoned by the amanita mushroom. When you are poisoned by that mushroom, if you have taken enough to be fatal, no human hand can save you. We know no antidote to that poison.

Thereupon Court adjourned to meet again at 10 o'clock a. m., Friday, June 17, 1910.

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Morning Session.

Kansas City, Missouri, Friday, June 17, 1910.

Court met pursuant to adjournment and the further hearing of this cause was resumed as follows:

Dr. Scott P. Child, called as a witness on the part of libelant, being duly sworn, testified as follows:

#### Direct Examination

By Mr. Butler:

Q. Your name is Scott P. Child?

A. Scott P. Child.

Q. What is your business? A. I am a physician.

Q. Where? A. In Kansas City, Missouri.

Q. Engaged in the general practice, in the practice of medicine here? A. Yes, sir.

Q. And how long have you been so engaged?

A. Fourteen years.

Q. Fourteen years, in Kansas City during all that time?
A. No, sir, for three years of that time I practiced in Pennsylvania for eleven years in Kansas City.

Q. The eleven years last past here in Kansas City?

A. Yes, sir.

Q. Where were you educated in your professional line?

A. University of Pennsylvania in Philadelphia.
 Q. When did you graduate there? A. In 1896.

Q. Are you familiar with the action of nitrite, nitrite of sodium and other nitrites?

1267 A. As drugs?

Q. Yes, and in the course of your practice have you had opportunity to observe the characteristic effect of the taking of nitrites?

A. Yes, sir.

A. Have you yourself administered it and watched the effects? A. Yes, sir.

Q. What is the characteristic effect of nitrites?

A. Nitrites are given as a rule in connection with heart and circulatory disease for the purpose of lowering a condition existing of elevated blood pressure, and administered as drugs in known doses. We find that there are certain characteristic symptoms and signs following the administration. The characteristic signs apparent to the eye, the flushing of certain blood vessels, especially of the face and of the upper parts of the body and extremities and alteration in the rate of the pulse and heart rate, and an influence upon respiration, and also certain changes in color which color we refer to the condition of the blood in the circulating vessels the peripheral circulating vessels.

Q. What is the characteristic change in color following

the administration of nitrites?

A. I am speaking of therapeutic doses.

Q. Yes.

A. From my observation there is an increase in the redness of the skin due to the dilation of the peripheral blood vessels.

Q. Those are the blood vessels near the surface?

A. Of the skin, where a synosis or blueness existed pre-

viously, this redness is relatively more marked.

Q. Relatively more marked. Have you had opportunity to observe the effect upon the mucous linings of the stomach, and so forth, of repeated doses of nitrites? A. No, sir.

Q. Or upon digestion?

A. No, I have not; that would include the toxic doses or the giving of certain acids which are administered

only in my practice for local application.

Q. Now you may assume for the purpose of expressing an opinion upon the points concerning which I will inquire, these facts, that the flour which was seized in this case was bleached by a process known as the Alsop process; that the bleaching resulted from the treatment of the flour with nitrogen peroxide gas which formed nitrous and nitric acid in flour; that the treatment was sufficient to substantially bleach or whiten the flour, and that bread made from this flour will contain nitrites, nitrite re-acting material, in measurable quantities. Now, assuming those facts to be true, I want to ask you whether or not the consumption of bread stuff made in whole or in part of this flour would injure or tend to injure the health of the consumers?

Judge Scarritt: We object to that, if Your Honor please, because the hypothetical question does not contain all the facts in evidence necessary to present to the expert witness.

The Court: Objection is overruled.

To which ruling of the court claimant then and there duly excepted.

The Court: You may answer it.

A. Knowing the physiology of digestion of proteids, carbohydrates and fats as accepted today, and knowing the recognized and acknowledged condition of bread as made naturally and normally, which makes it possible for the ferments of the different digestive glands to act upon and digest the component food products in the bread, the introduction of any substance which, as has been demonstrated is present in the bleached flour as nitrites and nitrates and from which nitric and nitrous acids have been obtained, and in my practice in medicine which has to do with the prescribing of diet, including bread, I must assume that the presence of these deleterious, poisonous products in any quantity must limit the digestive power of the ferments which act under certain normal

known conditions.

1269 Q. And the effect of the continued and customary use of such foods upon health, or the tendency, what can you say of that, if anything?

A. The continued persistent use of such food would lessen the digestibility of such food and necessarily limit the amount of certain products digested and absorbed, and thereby would necessarily limit the normal nutrition, and the maintenance of what is termed the metabolic equilibrium of the human individual.

Q. What are we to understand by the metabolic equilibrium?

A. By metabolic equilibrium we have in mind those destructive and constructive forces going on in the normal health of the individual for the maintenance of health and life, and that is brought about by the introduction of food through the

normal digestion and absorption and assimilation.

Q. Now, you may assume for the purpose of expressing your opinion that the treatment of this very flour which has been scized by the nitrogen peroxide gas mixed with air has rendered the same less digestible than it would have been had it not been bleached by that bleaching medium; and further assume that a poisonous substance—nitrites—has been added to the flour, and ask you whether or not, in your opinion, the introduction of such poisonous substance and the impairment of digestibility would render food made from the flour injurious to health or tend to render it injurious to health?

A. It would, in my opinion.

Judge Scarritt: I object to that, if Your Honor please, because the question is based upon the assumption of other expert witnesses, not upon the testimony as the facts in the case.

The Court: Objection is overruled.

To which ruling of the court claimant then and there duly excepted.

A. It would, in my opinion.

Q. Now, why so?

A. Because the presence of these substances stated as having been found are not normally present in these di-

1270 gestive juices or in the food products themselves. The digestive juices from long periods and centuries of addiction have accustomed themselves to digesting the starches of the proteids as found in the cereals which have been treated without the introduction or presence of the elements which are introduced in this particular flour.

Q. Now, as to the effect upon health of the delay in the process of digestion, what is the effect or tendency of that, assume the flour before bleaching, food stuffs made from flour before bleaching would digest more promptly, more quickly

than the same flour would if it had been bleached, what would be the tendency of the delay? A. The tendency—

Judge Scarritt: Same objection as to the last question.

The Court: Like the ruling.

To which ruling of the court claimant then and there duly excepted.

A. The tendency in delayed digestion from the normal periods of digestion expected would be that a portion of this food would be carried through the gastro-intestinal tract, and could not be absorbed and so keep up the normal state of health of the individual.

Q. That is, some of the food would pass by excreted without digestion at all? A. Without digestion and absorption.

Q. I think that it all.

#### Cross-Examination

By Mr. Elliott:

Q. Doctor, as I understood your testimony you are familiar with nitrites only in using them as a drug, is that correct?

A. Yes, sir.

Q. And their use in therapeutic doses?

A. In therapeutic doses.

Q. That is to say such doses as you give for any—for some specific disease?

1271 A. Yes, sir.

Q. Or diseased condition. Now, what doses have you

been accustomed to give to your patients?

A. I will state that so far as the use of the particular forms are concerned that I have used amyl nitrite and nitro-glycerin; that on nitro-glycerin I consider the patient's condition, watching it closely, and am governed by the approach to toxicological changes in the amount that I give whether it is one-hundredth of a grain or one-fiftieth of a grain of nitro-glycerine.

Q. I see I did not make my question quite specific enough. Let's take the case of—you don't understand there is any

nitro-glycerine in here, do you?

A. I understand that there is not.

Q. Let's take the case of sodium nitrite, we'll say some inorganic nitrite, just let me ask what has been your practice with nitrite as to the amount you have given in doses?

A. So far as my practice is concerned I don't use it; I know

of its use.

Q. I understood, maybe I am mistaken, but I understood you to say that you are familiar with the use of nitrites but you were not referring to sodium nitrite then? A. No, sir, nitro-glycerin is converted-

Q. You have not given nitrite-sodium nitrite?

A. I have not.

Q. You have never given that at all?

A. As a drug.

Q. Have you ever given it?

A. I don't know if I get your meaning.

Q. Have you ever given it at all? A. No, sir.

- Q. Do you know what the standard dose, what the dose given in the United States Pharmacoepia is, what is recommended?
  - From a half up to two grains; larger doses have been given.

1272 Q. Well, my information is it is from one to three grains.

A. I said half to two grains; larger doses have been given.

Q. As a matter of fact have not as high as twenty grains been given in one dose?

A. I understand that it has.

Q. In cases of asthma, for instance, isn't it, is it within your knowledge that as high as twenty grains have been given to the patient?

A. It is within my knowledge that as high as ten grains, I

don't want to say that twenty grains.

Q. Then your knowledge of nitrites as you have given it here is simply based on what you have been told or what you have heard has been given and as to the use of amyl nitrite in nitro-glycerin? A. In nitro-glycerin.

Q. And you yourself have never given sodium nitrite?

A. I have not.

Q. Then from personal observation you don't know the effect of sodium nitrite?

A. Not from personal observation, no, sir.

Q. And the effects that you have been describing produced by nitrites are to be ascribed to nitrites taken in considerable doses, such as a grain or a grain and a half or two grains, is it not, or more? A. Are you referring to the toxic—

Q. Well, you describe the fluishing of the face, and things

of that kind. A. Of the small deses,

Q. What do you mean by small doses, I understand you say you have not observed those symptoms yourself?

A. I was giving the symptoms formed from the action of the

nitrites.

Q. You are giving—I don't want to be rude at all, but weren't you giving what you can find in the textbooks 1273 as to the effect of large doses of nitrite, what the textbooks give you as the result?

 Along with my observations in the use of nitro-glycerin and amyl nitrate.

Q. But that is not sodium nitrite, I am speaking about sodium nitrite and inorganic nitrite.

A. I have not given either.

Q. And I say all you know about it, then, is what you can read in the textbooks, is that not so? A. Yes, sir.

And I understood you to say in answer to the question from Mr. Butler that you had never observed any impairment in digestion from giving repeated doses of sodium nitrite?

A. I have not from the giving of repeated doses of sodium

nitrite.

Q. He did not limit his question, however, to sodium nitrite; I think he said nitrites generally, and your answer would apply to nitrites generally, would it?

A. I have to say that the question I would like repeated

if that is-

Q. Well, I understood, Mr. Butler to say-to ask you if you had ever had any opportunity of observing inflammation of the stomach, I think it was, Doctor?

Mr. Butler: I think I said irritation; I don't think I said inflammation.

By Mr. Elliott:

Q. I don't care for the word irritation of the stomach or impairment of digestion by the giving of repeated doses of nitrite and you said no, is that correct?

A. As I understood the question it was in connection with

food containing the nitrites.

Q. Well, have you ever seen-noted any impairment of digestion by the giving of repeated doses of nitrites?

I have to giving of nitro-glycerin.

Now, then, as to the inorganic nitrite such as sodium

nitrite? A. I have not,

Q. You have not. Now, then, have you ever noted any impairment in digestion by the eating of foods contain-1274 ing nitrites? A. Not to my knowledge.

What experience, if any, have you had with observing bread that has been made from flour bleached under the con-

ditions assumed in Mr. Butler's question to you?

I have no positive observation.

Q. You have never compared the digestibility of bread made from the unbleached flour and bread made from the same flour

bleached, have you? A. I have not.

O. If a scientist in whom you had absolute confidence should state to you that he had compared the relative digestibility of bread from unbleached flour and made from the same flour bleached, and he found that the rate of digestion of the bleached flour or the bread from the bleached flour was either more rapid or less the same as the unbleached fleur, as the bread from the unbleached flour, would that tend to modify your opinion?

A. From my knowledge of physiology and digestion it would

not.

Q. It would not, but you have made no experiment yourself? A. I have not.

Q. And you would not take the word of a reputable scientist, someone in whom you had confidence, who actually made the experiment and demonstrated to you, you say that would not affect your opinion?

A. In medicine we do not accept restricted, limited experiments; they have got to be carried over a very large series of

cases for a long period of time.

Q. All right, let's assume, that, suppose that has been done.

A. It will be a matter of years and probably many years to prove.

Q. Then you think that—we had an experiment here where a gentleman brought in two tubes containing a gluten from the bleached and the unbleached flour and it was shown to the jury and introduced as exhibit as il-

lustrating the relative digestibility of the two; you think that is worthless, do you, it would not show anything; you think one experiment would not demonstrate that, do you, would you say that experiment was worthless?

A. I would not say it was worthless.

Q. Well, does it demonstrate anything in your opinion?

A. Nothing positive.

O. Sir?

A. Nothing positive excepting in that individual case, would not demonstrate anything except in that individual case.

Q. Suppose that it demonstrated that the bleached flour, the gluten from the bleached flour had digested the more rapidly, what would you say?

Mr. Butler: You don't claim any such thing, do you?

By Mr. Elliott:

Q. Suppose it had shown that the bleached flour had digested the more rapidly, what would you say, would you give any weight to it?

A. From your statement simply to say yes or not, I would

say I would not give any weight to that experiment.

Q. Suppose it had shown that the unbleached flour had digested the more rapidly, would you give any weight to it, or would you give the same weight to it and no more than you would give to the other?

A. It would bring up the question of the experiment carried on in the laboratory and the experiment over the function as

it exists within the human system.

Q. Well, I think it is very simple. I understood you to say that you could not demonstrate this question of the impairment of digestion of bread unless you conducted experiments over a long period of time, is that correct? A. Yes, sir.

Q. Then I say as to the single experiment, your judgment would be then that that would not demonstrate anything one way or the other, is that correct, is that so?

A. It would not demonstrate anything positively.

Q. All right, that is satisfactory. Is raw flour digestible?

A. Yes, sir.

Q. You think it is; did you ever try it? A. Yes, sir.

Q. Sir? A. It is digestible to a degree.

Q. I say did you ever try it?

A. Try it—I have eaten raw flour.

Q. The powder? A. I have eaten raw flour.

Q. And you say it is digestible to a degree, just what do you

mean by that?

- A. Physiologically we find that foods in different conditions are either more or less digestible, and to say that raw flour is digestible does not say that it is as digestible as cooked flour.
- Q. Yes, of course I quite agree with you, but my question is, is raw flour, I mean flour that we take out of this bag in powdered form, take a large dose of it—well, let's say a table-spoonful of it, would that be digestible? A. Yes, sir.

Q. You think it would, you think it would all digest if you swallowed it? A. I would not say that it would all digest.

Q. You mean some of it probably would be digestible, is that what you mean? A. Yes, sir.

Q. Now, I understood you to say as a basis for your opinion that nitrites such as you were asked to assume might be in the bread made from bleached flour, that nitrites were not, did

you say in the gastric juices or not normal in the gastric juices, I think?

A. I was not asked any such question. They are not

normally in the gastric juices.

Q. Let me see, I cannot just recall your testimony, he asked it something like this: You formed the opinion that this might be harmful because they were not normally in the juices that make digestion or cause the digestion of food, is that it?

A. Yes, sir.

Q. Now, have you any knowledge as to the presence of nitrites in the saliva?

A. In the normal saliva as secreted by the salivary glands

we do not find nitrites present.

Q. All right, sir. Now, let's take saliva after you get it into the mouth and ready to swallow it, have you any knowledge as to the occurrence of nitrites in the saliva?

A. Yes, sir.

Q. It is inevitably there, isn't it? A. Yes, sir.

Q. Now, then, with your food, bleached flour, a man eating food must swallow a certain percentage of nitrites with his

food, mustn't he? A. Yes, sir.

Q. And sometimes—or I will ask you also, is it within your knowledge that certain natural food products and certain mixed foods as we buy them on the market, are prepared for to eat, contain a certain amount of nitrites, can they?

A. Yes, sir.

- Q. And in eating those foods he would inevitably swallow a certain proportion of nitrites, wouldn't he? A. Yes, sir.
- Q. And those things would inevitably go into his stomach and mix with the gastric juice or whatever acts on the food?

A. Yes, sir, the presence of the nitrites in the saliva is due to the presence of—

1278 Q. We have had all that, Doctor,—you have not been here—it has been thrashed out thoroughly—I was not trying to establish by you that they are there or not. I am just rather assuming, you say they would inevitably be there in the saliva, and that is all I care for.

Mr. Butler: Let him answer if he desires to.

Mr. Elliott: I have no objection, I simply want to save time.

The Court: Let me suggest, it has been very thoroughly covered that it looks to me like duplicating it.

Witness: The only reason that I wish to answer-

The Court: You may tell your views generally if you care to, but don't go into details unless counsel for one side or the other desires it.

A. The fact is that the bacteria present in the gastrointestinal tract, and in the saliva producing the nitrites represent an abnormal condition, and their presence tends to impair health, and so far as they produce the nitrites, that tends to impair the health of the individual and to keep him below what I stated as the metabolic equilibrium.

By Mr. Elliott:

Q. All right, sir; but the fact is whether it impairs health or not, that inevitably mankind as we know it is constantly swallowing saliva containing nitrites and is constantly eating foods containing nitrites, isn't that true? A. Yes, sir.

Q. And if there is any impairment of digestion from nitrites he will have it with those things just to the degree that they are there, the same as he would have it with this bleached flour, wouldn't he? A. Yes, sir.

All right. In breathing air is it within your knowledge O. that he breathes a certain percentage of nitrites?

A. He does in certain regions, in certain districts, 1279

where it is artificially produced.

- Take it in the country. I don't know what you mean by artificially produced, take it away out in the country, away from the cites, isn't a certain percentage of nitrites in the air, or if you don't want to say nitrites, nitrite re-acting material?
- A. There is a very small portion in the last regions. Q. And in drinking water doesn't it frequently occur that nitrites are in potable drinking waters,—waters that any water analyist would pass [-] a table and good drinking water?

A. It is perhaps a question as to whether he would consider it a good drinking water, though commonly used.

- Q. My question was, a water that he would pass as a good potable drinking water containing a certain percentage of nitrites, that is common knowledge, isn't it, Doctor?
  - Yes, sir, though I would like to qualify it. Well, go ahead, you answered the question.

It is recognized that their presence frequently, if not usually indicates the presence of organic matter which is del-

terious to health.

Yes, in other words, the presence of nitrites in water may indicate that at some point there is contamination, but I think we have also had, if not, I will ask you if the examination is made and no contamination is found, isn't it a fact that in these small amounts those waters will be passed as perfectly good drinking waters? A. They are,

Q. That is all.

Dr. Robert T. Sloan, called as a witness on the part of libelant, being duly sworn, testified as follows:

# Direct Examination

By Mr. Butler:

Q. I did not get your first name, Doctor?

Robert T. Sloan. 1.

Where do you live? O. A. Kansas City, Missouri.

Q. You are practicing? A. Internal medicine. And where were you educated as a doctor? 0.

In the Kansas City Medical College, now a part of the Kansas University, and in the Medical Department of the University of New York.

How long have you been engaged in the practice of

medicine?

Twenty-five years.

Have you done any teaching? A. Yes, sir. O.

Where? Q.

A. At the Kansas Medical College, and later at present in the medical department of the Kansas State University.

Q. What subjects do you teach?

A. I taught physiology for some years, the last eight or ten years I have been teaching medicine.

Q. Internal Medicine? A. Internal medicine.

Q. That has to do with the effect of drugs upon health?

A. Yes, sir.

Q. And various substances, you have been teaching that regularly for the last eight or ten years?

A. Yes, sir.

1281 Q. At the University of Kansas?

A. Well, the last five years in the University of Kansas; prior to that in the Kansas City Medical College which was absorbed by the University of Kansas.

Q. Yes, sir. My [understand] is that the University of Kansas is situated at Lawrence not far from Kansas City?

A. Well, the medical department is situated in Rosedale, a suburb of Kansas City.

Q. So that the medical college of the University of Kansas is practically in this city?

A. Yes, sir.

Q. It is very desirable, isn't it, in medical and surgical institutions to have it near clinical material and sick people?

A. Yes, clinical material.

(). Near centers of population. Now, Doctor, we want to take your opinion about a hypothetical question which I will ask, and in which I will ask you to assume certain facts. This is a proceeding by the Government to condemn as adulterated certain flour. You may assume to be true that the flour seized, complained of, was bleached by a process known as the Alsop process, which bleaching was affected by treating the flour with nitrogen peroxide gas mixed with atmospheric air to such an extent that the flour was substantially whitened; that upon such treatment the gas coming into contact with the flour and the moisture contained therein, there was formed in that flour two acids, nitric acid and nitrous acid, and there was added thereto poisonous substances, among them nitrites, organic and inorganic; you may further assume that this flour, and food stuffs made in whole or in part by its use, was by this treatment rendered less digestible thanif would have been had it not been so treated; and you may further ssume that upon the consumption of bread containing these nitrites so added an effect would be had upon the blood of the consumer depending in extent upon the quantity of nitrites consumed in the bread; that the effect is a chemical

one, changing the hemoglobin of the blood to met-hemo-1282 globin, and upon these facts I want to get your opinion as to whether or not the continued and customary use of bread made from such flour would be injurious to the health of consumers or tend to be so injurious? See p. 436.

Judge Scarritt: Just a moment. I object to that, Your Honor please, because the question does not include all the testimony necessary to present the hypothetical question to the witness; further, it is based upon the assumption of opinions of other witnesses, and, third, that it invades the province of the jury, and calling for a decision of the issue that is involved in this case, calling for a decision of the issue that is involved in this case.

The Court: Objection is overruled.

To which ruling of the court claimant then and there duly excepted.

Q. Go on, doctor, you may answer.

A. In my opinion that would be the tendency.

By Mr. Butler:

Q. What would be the tendency, doctor?

A. To be deleterious to health.

Q. Upon what do you base that opinion, either in your experience or professional learning?

Judge Scarritt: I object to that because he has already said that he based it upon the hypothetical question.

Q. Well, I mean the reasons for his opinion, of course it assumes the facts.

Judge Scarritt: For the reasons asked in the hypothetical question. When that is answered why as far he is concerned that ends it. We object to it for that reason.

The Court: You may answer it; go ahead, doctor,

To which ruling of the court claimant then and there duly excepted.

 I base it upon my knowledge of the effect of nitrites on the economy in the body as used in medicine.

1283 By Mr. Elliott:

Q. We can not hear you down here.

A. I say I base my opinion upon my knowledge, both clinical experience and the knowledge acquired from general reading, of the effect of nitrites as we use them in medicine on the body.

By Mr. Butler:

Q. What would be the effect upon blood pressure, temperture and the like if there would be any effect of the customary use of food stuffs made from bleached flour containing it, which food stuffs would contain nitrites.

A. In my opinion the continued use of small doses of nitrites day ofter day, month after month, the tendency would be to depress the blood pressure, to lower it, and to even cause a lowering of the body temperature to a slight extent.

Q. Now what is the effect, if there is any, upon health and the reduction of the blood pressure and the lowering of bodily

temperature?

A. It diminishes the natural nutritional acids of the body, makes the individual less resistant certainly to fatigue and conditions of that sort, possibly less resistant to the ravages of infectious diseases, possibly degenerative diseases.

Q. Now is the impairment of the power of resistance to these things which you have referred to considered by your

profession a grave matter?

A. Yes, it is injurious to the health, making it more difficult to maintain health, certainly more difficult to maintain the usual body strength and vigor.

Q. Have you yourself had to do with cases of lower blood pressure and lower bodily temperature so as to be able to—

Judge Scarritt: Nitrites you mean?

Mr. Butler: Well, perhaps he don't know the cause, I am not sure, he may not know nitrites were in the bread, I am not sure.

Judge Scarritt | I object to it because outside of the issue in this case,

1284 The Court: He may answer that.

A. I have seen many such cases,

Q. Where? A. Where do you say?

Q. Yes.

A. In my office and at their homes.

Q. You mean in practise here in the vicinity?

A. Yes, sir, in my practice.

Q. And when?

A. I suppose I see them every week when I am at home; that is when I am in the city doing business,

Q. What is the remedy, if you know, for such a condition of affairs? A. Well, now, that is a long—that would require a long answer.

Q. Then I will not ask the question.

A. It is an exceedingly difficult condition to remedy.

Q. And is it considered a serious condition? A. Yes, sir.

Q. Now with respect to the character of persons suffering from such depressed blood pressure and lower temperature, are they children, or women, or men, farmers or professional men?

- A. We see them among men, women, farmers and people in the city. They are observed most frequently among that class of patients that we say are suffering from nervous exhaustion.
  - Q. (By Judge Scarritt) From what, doctor?

A. Nervous exhaustion, neurasthenia.

#### By Mr. Butler:

Q. Now what would be the effect upon persons having neurasthenia, or neurasthenia, as I sometimes call it, of the consumption of bread and other food stuffs made from flour containing these nitrites?

A. Well, I should think that the tendency would be for them to suffer more than normal individuals would, 1285 the circulation, blood pressure, their temperature being more depressed.

Q. I think that is all.

#### Cross Examination

By Judge Scarritt:

Q. Doctor, did you ever diagnose a case as nitrite poison-

ing from eating bread in any patient? A. No, sir.

Q. All these people that you talk about having low blood pressure are people that you could ascertain, either reasonably or with some certainty, by reason of their past history, their past work or past employment or habits, that occcasioned the symptoms that were brought to you?

A. On the contrary, I could not.

Q. You could not?

A. In the majority of the cases, no, sir.

Q. In the majority of cases? A. No, sir.

Q. That is if a person has nervous prostration he has low pressure of blood?

A. No, I didn't say that.

Q. Nervous exhaustion I meant to say?

A. Many cases of nervous exhaustion so-called, have a subnormal temperature much of the 24 hours, and a low blood pressure, not all of them.

Q. But you never attributed that to their eating bread with nitrites in it, did you?

A. I don't know what the cause of it is.

Q. I say you never did that, did you? A. No, I never did.

Q. Well, now, doctor, if a patient comes to you, or you examine anybody you want to know what the history of that person is with reference to what he claims to be suffering from

and what the sysptoms are, don't you? A. Yes, sir.

1286 Q. Now if the symptoms of nitric poisoning are a red
face, red shoulders and red breast and suffocation in
breathing, those things that you can see, they indicate what
the trouble is, don't they, and when you have those symptoms,
why, you attribute the disease to what you know precede the
symptoms, don't you?

A. There is a great difference between acute and chronic

poisoning; they are not alike at all.

Q. If anybody is suffering from poison by eating bread three times a day it is apt to be chronic, isn't it?

A. Yes, sir.

Q. And if nitrite poisoning, as has been testified to here, without any reference to whether it was acute or chronic, produces certain symptoms, why those symptoms would appear wouldn't they?

A. As far as I know there has been no testimony as regards

the symptoms of chronic nitrite poisoning.

Q. Well, then this testimony here is of no account then as far as this case is concerned, it has been given here without reference to whether it is chronic or acute, if the symptoms of nitrite poisoning consisted of a flushing, of a flush of the face, of the shoulders of the chest, exhaustion, and irritation and suffering from closeness of breath or suffocation?

A. The symptoms of acute nitrite poisoning are very much

such as you have described.

Q. Such as I have described?A. Yes, sir, acute poisoning.

A. Yes, sir, acute poisoning.
 O. Now what are the symptoms of chronic nitrite poisoning?
 A. That is what I don't know.

Q. Nobody else knows do they? A. No, sir.

Q. Because no case has ever occurred has it?

A. I presume that I have seen many cases.

Q. You presume so? A. Yes, I believe it.

1287 Q. But you never could trace it, could you?

A. No, sir.

Q. And nobody knows what the real symptoms of chronic nitrite poisoning are if there are any, do they?

A. Nobody knows.

Q. You are a good diagnostician?

A. Nobody knows definitely.

Q. And your specialty is, or rather your general work or most of your work is diagnosing cases, isn't it?

A. No, that is part of it.

Q. A good deal? A. That is part of it.

Q. Well, you pay particular attention to them? A. Yes.

Q. Got a knack for that and you have tried to find out these things, haven't you?

A. No, but I know of no more reasonable hypothesis.

Q. That is not answering my question.

Mr. Butler: Let him answer.

Judge Scarritt: I want him to answer but not to argue it.

The Court: Proceed, it can be brought out on re-examination if desired.

Q. Now you give your patients arsenic sometimes, don't you? A. Yes, sir.

Q. Do you give them arsenic to make them better, do them good? A. Yes, sir.

O. You give it to them in small doses, don't you?

A. Sometimes, I don't give them any poisonous dose as a rule.

Q. You don't give it to poison them but you give it in such doses as you think will do them good?

A. Yes, sir, that is my intent.

O. And you give them strychnine? A. Yes sir.

1288 O. For the same purpose and the same reason, whereas if you had given them what you call poisonors doses, they would have been fatal and would have injured them, wouldn't they? A. Not necessarily fatal.

O. Well, if you gave them large enough dose it is fatal?

A. Yes, if you give them enough it is fatal.

O. So if you give them doses which are not necessarily fatal, it would impair their health, wouldn't it, in large doses?

A. Yes.

It is conceded by both parties to this action that I. S. No. 9127 B is the same as "Purity" sack of flour marked as "Exhibit 12".

Hannah L. Wessling, recalled as a witness on the part of libelant, further testified as follows:

## Direct Examination

By Mr. Butler:

Q. Miss Wessling, did you make a determination of the ash content of the flour contained in the sack marked "Exhibit 12"?

A. I did.

Q. How much is it? A. 0.48.

Q. Yes, some amount less than half of one per cent?

A. Yes, sir.

Q. Did you make more than one determination?

A. I made two.

Q. What did you get each time?

A. The first time I had .486, and the second time .487.

2. 0.486 once and 0.487 the next time? A. Yes, sir.

1289 By the Court:

Q. 1/1000 of difference? A. Yes, sir.

Cross-examination declined.

A. V. H. Mory, recalled as a witness on the part of libelant further testified as follows:

#### Direct Examination

By Mr. Butler:

Q. Your first name again, Mr. Mory?

A. Austin is my first name.

Q. You testified here before? A. Yes, sir.

Q. With respect to the analysis of the—he is in charge of the laboratory in this city—and you testified concerning the analysis of a certain substance taken from the pipe. Did you make a determination of the ash content in the sack marked "Exhibit 12" the flour branded "Purity" which is in evidence here? A. Yes, sir.

Q. What did you find it to be?

A. 48/100 of one per cent.

Q. That is 0.48? A. Yes, sir.

By the Court:

Q. No decimal beyond that?

A. I made two determinations, the first one .481, the second .482.

Q. (A jar marked "Government's Exhibit 50" one kilogram of flour seized is shown to the witness). Mr. Mory, did you measure the contents of that bottle?

A. I weighed and placed into the jar the flour that is in there.

Q. And how much flour is there?

A. There is one kilo or 1,000 grams.

1290 Q. And the label shows of the flour seized?

A. The flour was delivered to me by Mr. Winslow and said by him to be the flour seized.

Q. Do you know whether it is the sack he brought two sacks from Greencastle?

A. I presume so, he can tell you that.

By the Court:

Q. That is about a quart and a half or something like that?

A. It is a little less than a quart and a half, a little over a quart, not much, about 9/10 of a—

Mr. Butler: I understand that is flour from "Exhibit 13" that may be conceded.

Mr. Elliott: Yes, sir, sure.

Mr. Butler: It is offered in evidence.

Q. (Now "Exhibit 51" is called to the attention of the witness) What is that?

A. It is nitrogen peroxide gas.

Q. In what dilution? A. Five times with air.

By the Court:

Q. Sir? A. Diluted five times with air.

By the Court:

Q. Five parts air?

A. One part of nitrogen peroxide to four parts of air, and five parts altogether.

Judge Scarritt: Let me understand that.

Mr. Butler: Four parts of air and one of nitrogen peroxide, so if you divide the quantity by five you get the pure peroxide gas.

By Mr. Butler:

Q. Now what do you call this glass, has it any-

- A. That is a measuring cylinder, it is treated in cubic centimeters that has a capacity indicated of 100 cubic centimeters.
  - Q. The capacity estimated to the extreme top is about?

A. 125 cubic centimeters.

Q. So you would say that in that bottle there is 125 centimeters of nitrogen peroxide gas diluted with air as four to 1? A. Approximately that, very close to that.

1291 Mr. Butler: That is offered in evidence.

Q. ("Exhibit 52" is called to the attention of the witness) On this card appear to be three little glass holders and something in each one of them. What is in each one of them?

A. I will have to see the card, I can't tell it from this distance.

Q. What is the substance?

A. In the one at the left there is sodium nitrite, in the one in the middle there is a mixture of sodium nitrite and sodium nitrate, the one on the right contains sodium nitrite.

Q. For the purpose of indicating the quantities expressed in milligrams have you computed in terms of nitrite of sodium the amount of nitrite of sodium that would be introduced into one kilogram of the flour seized, assuming that there was found 1.8 parts per million of nitrite reacting material calculated to the terms of nitrogen? A. I have.

Q. How much would there be of nitrite of sodium?

A. There would be nine milligrams nitrite of sodium, that is to say, nine milligrams of nitrite of sodium expressed as nitrite of sodium, the nitrous nitrogen 1.8 expressed nitrate of soda, and it would be 9 milligrams.

Q. Yes, that is what I am getting at.

A. That is nine milligrams to the kilogram of flour.

Q. Now assuming the [equivocal] chemical or molecular quantity of nitrate of sodium have you computed the volume—amount of both the nitrite and the nitrate of sodium?

A. That is, I have computed the nitrate which is associated necessarily with this 1.8 nitrous nitrogen, I have.

Q. And what amount would that be?

A. Nine milligrams of sodium nitrite and 10.8 milligrams of sodium nitrate to the kilogram of flour.

. Yes, now what do you call these glasses, is there any

1292 A. I simply made those myself out of a little glass tube.

Q. In this little glass holder indicated on "Exhibit 52", by the figure 1 how much sodium nitrite is contained in that?

A. Nine milligrams as I said.

Q. And in the little holder marked 2 how much nitrite and how much nitrate?

A. Nine milligrams of nitrite of sodium, and 10.8 milli-

grams of the nitrate of sodium.

Q. And in the little holder marked 3 on "Exhibit 52" how much?

A, In the little holder marked 3 at the right there are 65 milligrams or one grain.

Q. Of nitrite of sodium? A. Of nitrite of sodium, Q. What is in the "Exhibit 53"? A. The same flour.

Q. How much? A. One pound avoirdupois.

Mr. Butler: That is introduced in evidence,

Q. What is in "Exhibit 54"?

A. Nitrogen peroxide gas diluted five times that is one part of gas to four of air.

Q. And how much is the total volume?

A. Very close to 57 cubic centimeters; it is only approximate in that case, but I took the exact amount, I took 11.4 cubic centimeters in the nitrogen peroxide the calculated amount, and diluted it to the cylinder full which is 57 cubic centimeters.

Q. And that is scaled on here what?

A. Cubic centimeters,

Q. And to get at the amount of pure peroxide divide the total by five? A. By five.

By Mr. Elliott:

Q. You say that contained 57 centimeters?

1293 A. I say that I introduced 11.4 cubic centimeters of nitrogen peroxide and diluted to the cylinder full to the cork; it is not crowded all the way up but I estimated that is the approximate dilution, the quantity of nitrogen peroxide would not be as accurately introduced, accurately measured, and that is about five times dilution 57 I gave is five volumes of the 11.4 CC.

Q. "Exhibit 55" you may tell what is on that card?

A. In the left hand position the small glass tube marked No. 1 there are 4 milligrams of sodium nitrite, equivalent of 1.8 milligram per kilogram, that is to say, parts per million, of nitrous nitrogen present in the one pound of flour in question.

Q. That is on the assumption that it shows 1.8?

A. 1.8 parts per million of nitrous nitrogen which is the equivalent of 1.8 milligrams per kilogram.

Q. Now is that a weighable amount according to chemical

principles?

A. Oh yes, the ordinary analytical balance takes accounts of 1/40 of that amount, and this amount is weighed accurately to 1/40 of the quantity present or 1/10 of a milligram.

- Q. Yes. Now assuming that a kilogram of flour was treated with 25 cubic centimeters of the gas, the flour contained in "Exhibit 50" would then be subject to the amount of nitrous peroxide, nitrogen peroxide gas which is contained in "Exhibit 51"?
- A. According to the average quantity given in the testimony in this case my own experience—

Q. I know, I say assuming that it be treated by 25 parts-

A. Yes, sir.

Q. 25 cubic centimeters to the kilogram— A. Yes sir.

Q. Then this quantity of flour in the jar which is marked one kilogram would be subject to a volume of gas—

A. Yes, sir.

Q. In different dilutions to be sure- A. Yes sir.

Q. Equal to that contained in 51? A. Yes sir.

Q. And there would be introduced into the flour nitrites to the quantity of 9 milligrams? A. Yes sir.

Q. If the flour showed only 1.8 parts to the million of

1294 nitrites calculated in terms of nitrogen?

A. Yes, sir.

Q. And the "Exhibit 53" one pound of flour if treated by this bleaching process with the corresponding volume or a volume corresponding to 25 cubic centimeters to the kilogram would be subject to the amount of gas contained in "Exhibit 54"? A. Yes, sir.

Q. And there would be added nitrite reacting material which in terms of uitrite of sodium would be four milligrams?

A. Four milligrams.

Q. And the corresponding nitrites indicated?

A. Yes, sir, nine milligrams altogether.

Q. And the one grain of nitrite of sodium on "Exhibit 52"?

A. The same on each card.

- Q. And on "Exhibit 55" is placed here simply to indicate the relation of one grain?
- A. Well, further than that to indicate what is given in the United States Pharmacopoeia as the average dose of sodium nitrite.
  - Q. The average medicinal dose of sodium nitrite?

A. Yes, sir.

Q. I think that is all.

#### Cross-Examination

By Mr. Elliott:

Q. Just let me see if I understand what these things are. If I understand your testimony you say that if you take 125 cubic centimeters of the mixture such as contained in "Exhibit 51" which is peroxide of nitrogen and air in proportion of one to four, as one of peroxide and four of air, that you will have in a kilogram of flour nine milligrams of nitrite reacting material reaction as sodium nitrite? A. Yes, sir.

Q. That is correct, is it? A. That is correct.

Q. And this little receptacle on the left in "Exhibit 52" No. 1, in receptacle No. 1 at the left of "Exhibit 52" contains the quantity of sodium nitrite which you have calculated?

A. Corresponding to 1.8 milligrams of nitrous nitrogen to the kilogram of flour, that is if that is the first card analyzed.

Judge Scarritt: 52.

1295 A. I can't tell them from this distance. (Counsel hands exhibit to the witness) Yes, sir, that is correct.

Q. Now you did not as a matter of fact get any sodium

nitrite from this flour? A. Oh, no.

Q. And you have simply calculated that if there is 1.8, an amount equal to 1.8 per million of the nitrite reacting material in this kilogram of flour, and it has been treated with 125 cubic centimeters of the mixture of peroxide of nitrogen and air, in the proportion of one of peroxide to four of air, it will contain nine milligrams of sodium nitrite?

A. Well, I would not restrict myself to the dilution indicated here; that was only a method of showing the quantity of the gas, of course, the treatment would not imply that strength gas at all.

Q. Well, I thought you intended to give a direct relation.

Mr. Butler: I showed him different dilutions.

Q. I am trying to get, I understood there was a direct relation between this amount of the mixture and this amount of sodium nitrite which you have calculated?

A. Mr. Elliott, consider these two as this being the cause

and this the effect, then divorce that from the-

Q. 51 and 52.

A. From the flour, and consider this as representing the container and the thing contained.

Q. All right then, this Exhibit 51 has no necessary relation,

has it, to the nine milligrams of sodium nitrite?

A. No, sir, if I were to calculate all the nitrite and nitrous acids—

Q. Well, that is all right.

A. Represented by that solution I would have as much as a grain of—

Q. Then Exhibit 51 has no necessary relation to this kilo-

gram of flour or to tube No. 1 of Exhibit 52?

A. Except as my experience shows that the quantity of NO2 is found necessary to produce the effect found in this flour. Now in considering these little exhibits I agree the gas is not to be taken into consideration.

1296 Q. All right, now let's get at it that way then, is this the fact, that assuming that this kilogram of flour contains 1.8 per million of nitrite reacting material, you say it contains nine milligrams reaction as sodium nitrite, you say it contains nine milligrams reaction as sodium nitrite?

A. Yes, sir.

O. That is all that amounts to?

A. Yes, that is what that amounts to.

Q. And in the same way in this Exhibit 53, one pound of flour, contains 1.8 parts of nitrite reacting material?

A. To the million.

Q. It would contain 4 milligrams? A. Yes sir.

O. Reaction as sodium nitrite? A. Yes, sir.

Q. And the little receptacle to the right, that is receptacle No. 3 in each of these exhibits merely gives the one grain of hum nitrite to represent the amount of what you say is the average dose? A. Yes, sir, 65 milligrams or one grain.

By Mr. Butler:

Q. You speak of nitrite reacting material, I presume you mean computed as nitrogen that you referred to a few minutes ago.

Mr. Elliott: Yes, sir.

By Mr. Elliott:

- Q. And in neither of the cases of Exhibit 52 and Exhibit 55, was any of the sodium exhibited obtained by you from any flour?
- A. Not in this case, no sir; in fact I would not expect to obtain it in that form.
  - Q. That is all.

#### Redirect Examination

By Mr. Butler:

Q. Now so that there may be no misunderstanding about it, the volume of gas corresponding, which is in Exhibit 51, corresponding to the kilogram of flour was not intended by you to be the amount of gas required to produce the amount of

nitrite or nitrate of sodium on the card showing 9 milligrams of sodium nitrite? A. It was not.

Q. But that was the amount of gas in different dilutions to be sure, which would be required to treat this flour by 25 cubic centimeters to the kilogram? A. Yes, sir.

Q. And the experience that you refer to as justifying the assumption that it would take that much gas to produce the 1.8 reacting material computed as nitrogen is based on certain testimony of Mr. Shepard and Winton and perhaps others?

A. Yes.

Q. Already in the case, and not upon your own?

A. That is true.

Mr. Butler: I think that makes it all clear, doesn't it?

Mr. Elliott: It was clear to me before.

Q. Well, I was not perfectly sure that it was, Mr. Elliott, but the amount of gas itself in Exhibit 51, if used to produce nitrite of sodium, would make very much more?

A. It would make about 90 milligrams instead of nine.

Q. How many milligrams in a grain-65?

A. 65. I would like to make one further statement if I may.

Q. Yes, sir.

A. My reason for choosing sodium nitrites to illustrate the quantity for observation that is to be seen was this, that it gave the smallest quantity of any salt or combination of nitrous acid that I might choose, and my reason for not choosing to show the nitrous acid itself is that it does not exist in the pure state but only when in solution with water, and the exhibition of the solution would, of course, give erroneous ideas of the quantity present, would give an exaggerated notion. This sodium nitrite is the salt which would give the smallest quantity of material when 1.8 parts per million or milligram per

kilogram of nitrous reacting and nitrogen is calculated to the salt. That is my reason for it; in other words, I have 1298 endeavored to give the benefit of the doubt in every case to the assumption that the quantity is small.

C. E. Brewster, called as a witness on the part of libelant, being duly sworn, testified as follows:

#### Direct Examination.

By Mr. Butler:

Q. Mr. Brewster, where do you live?

A. Rosedale, Kansas.

Q. What is your occupation?

A. Second miller, Southwestern Milling Company.

Q. That is the Rex mill?

A. Rex mill at the present time.

Q. Is that where the flour "Aristos" is made?

A. It is.

- Q. Were you out there at the mill at the time that Prof. Hulett and Dr. Boos and Prof. Acree came out and examined the place and had some flour bleached, some "Aristos" flour bleached? A. I was.
  - Q. And took some gas? A. I was. Q. That is an Alsop bleacher, is it?

A. It is.

Q. How long have you been familiar with that particular blencher?

A. Well, I believe about two years.

Q. Are you familiar with the adjustment of it in the way it was used when ordinarily employed for bleaching?

A. Yes, sir, I am.

1299 Q. Is the "Aristos" flour as it is now being made, when I say now, I mean recently, a bleached flour?

A. It is not.

Q. It is not, you don't bleach the Aristos?

A. Not now.

Q. And have not for how long?

A. I guess it would cover a period of three months if I am not mistaken.

Q. Now did you observe Prof. Hulett take the gas that he took in the flask right near the agitator where the Aristos was bleached? A. I did.

By the Court:

- Q. At the elbow? A. Yes, sir, I did.
- Q. Where he bored a hole in the piece at the elbow, something like that? A. Yes, sir.

A. Yes.

Q. Now how was your machine running at the time as compared with the way that it usually runs when you bleach Aristos flour, the patent flour, high grade flour?

A. It was running as hear normal as I could set it.

Q. How many generating machines did you have in use?

A. We have what would be termed a twin unit, as I would call it, two electrifiers and one generator.

Q. Two electrifiers and one generator?

A. Yes, sir,

Q. That generator is a dynamo? A. Dynamo.

Q. Which makes the electricity. Now the electrifiers was that up in one enclosure or were there two?

A. No, the generator and electriflers were all in the same

enclosure in the fire proof room.

Q. Well, I didn't mean in what room they were in, but what I am trying to get at is the gas machine, they call it an electrifier?

A. They are separate from the generator.

Q. They are separate from the generator. Now was that gas machine in one box or was there two boxes?

A. Well, each electrifier is by itself.

Q. And the voltage did you know at the time?

A. The machine is one with 500 volts, 15 amperes and 7 1/2 kilo watts, that is the rating.

Q. Do you know what was on at that particular time?

A. 4 1/2 amperes.

Q. Now at the time of the bleaching of this particular flour Aristos that was bleached for the purpose of observation in this case, by the gentlemen, who went out, how many agitators were taking gas at that time?

A. At that time all four agitators were taking gas.

Q. Now one pipe leads from the gas generator?

A. From each electrifier a pipe leads joined to the main lead pipe to the retaining tank or equalizing tank.

Q. Yes.

A. From there it is piped to the four agitators.

Q. And all four were on it? .
A. All four belts were set.

Q. Now at the time do you know how the machine was adjusted at the time that another bottle was taken by Prof. Acree, or did you observe that?

A. Well, I observed the taking a bottle when we had three agitators on only.

Q. When you had three on? A. Three on.

Q. And did you observe when they had less than three on?

A. I observed when we had none on whatever.

Q. So there was one, and there was one specimen taken when there were four on, one specimen when there were three on? 1301 A. Yes, sir.

Q. What three were on?

A. When three were on?

[A]. Three were off, that.
Q. Well, that is what I thought, the fact was, but I misunderstood you? A. Oh no, we had—

Q. Prof. Acree took his when all four agitators were tak-

ing gas?

A. They were on then, yes, certainly.

Q. And three were shut off?

A. Three were shut off and one on.

Q. And then Prof. Acree took his specimen?

A. He took his specimen in a large table, I would call it, with all the agitators close.

2. Well, there were three specimens taken or two?

A. Three with the first specimen when the flour was being blenched.

Q. Yes, that was by Acree?

A. I don't know.

Q. Hulett, the man with the whiskers? A. Yes, sir. Q. And the next one was when all three were shut off and

all of the gas was running through one agitator?

A. The by passes, yes, sir, all of it was by-passed through one agitator with the exception of what went through the tube.

Q. Now that was taken by Acree, was it not, and then they

were all shut off?

A. Then they were all shut off.

Q. And there was a third amount of gas taken?

A. From a large bottle, looked to be about a gallon or such a matter.

Q. Now in bleaching flour out there, bleaching—the Aristos is your patent flour?

1302 A. Yes, sir.

Q. And the custom was of bleaching just as it was when Acree took his sample?

A. It was as near as I could set it.

Q. And the bleaching was going on at that time?

A. When they took the sample, yes, sir.

Q. Does this gas have any odor, that is employed for bleaching? A. Yes, sir, it bas.

Q. Couldn't it always be smelled about the agitators and

the pipes?

A. It can, that is, if there are any of the valves open leading to it, and if you can open the exit spout you can smell it there.

Q. That is where it runs out?

A. Yes, where the flour comes out.

Q. Now you have observed the bleaching which results from the treating of flour by the Alsop process when the machine is adjusted as it was adjusted that day at that time when Hulett took the gas; you have observed it frequently as a matter of practice? A. Oh, certainly.

Q. Does the condition of the weather or moisture or temperature or anything of that sort affect the bleaching so as to require varying amounts of gas under different conditions?

A. It does to a degree, I might say, of half an ampere,

something like that.

Q. Now what conditions make more gas necessary?

A. Well, we have a harder variety of wheat, or have our mixture is not tempered as much as at other times, we have to use more gas, and if we have a softer quality of wheat or a mixture of wheat that has been well tempered, we naturally cut back on it a little bit.

Q. Now do the conditions of the weather or anything of

that sort effect it?

A. Well, they affect it in this way, my observation has been, of course, not in connection with the bleacher because I don't

understand mechanical, that is, the chemical action of 1303 the formation of these gases, but our wheat naturally changes its temperature of its own accord under these same conditions.

Q. So then it is a matter of adjustment to get the right amount? A. Yes, sir.

Q. Depending upon all the milling conditions?

A. Certainly. Q. That is all.

### Cross-Examination

By Mr. Elliott:

Q. How long has that Alsop bleacher been in that mill, do you know?

A. I think it will be two years this fall since they put it in

the Rex plant.

- Q. What change, if any, was made in that bleaching apparatus since the time it was installed and the time that these gentlemen came over there and got specimens of that gas?
  - A. None that I know of.Q. None that you know of.
- A. No, sir—you mean in the outline of the machinery, etc. and so forth?

Q. Yes, any part of it?

A. No part of it, installed just as we put it in.

Q. When did you stop bleaching flour at that mill?

A. Well, we were not running the plant, this plant, when we stopped bleaching flour the last time, they were running the A mill.

Q. What is the "A" mill?

The "A" mill, of the Southwestern Milling Company which is at 18th and Kansas Avenue.

Has that a bleaching plant? A. Yes, sir.

Is that bleaching flour now? Q.

Not now, no sir.

When did it stop? 1304 Q.

About three months ago, as near as I can remember.

Well, I want to get the definite date, is that the nearest you can give it?

I can furnish the date. A.

About three months ago? A. Yes, sir. Q. Is that a different mill from this Rex mill? Q.

Yes, sir. A.

When did you stop bleaching in the Rex mill? Q. I believe it is in November when we shut down. A.

Last November? A. Yes, sir. Q.

What do you mean by shutting down, the electrical ap-Q. paratus or the whole mill?

The whole plant. A.

- A. Yes. The whole plant? Q. When did you start it up again? Q.
- Started up again I presume two months ago. A.

Two months ago? A. Yes, sir. Q.

You did not start bleaching? A. No, sir. Q.

And you bleached the flour in that Rex mill up to the Q. time you shut down the plant?

Last fall. A.

Last fall? A. Yes, sir. Q.

And since last fall you have not bleached any flour? Q.

We have not. A.

At that Rex mill? Q.

We have not bleached our flour at the Rex mill

since it started this last time, no, sir. 1305

Then this apparatus had not been used since last fall up to the time these gentlemen came there, is that true?

Well, not for commercial purposes, no, sir.

What do you mean by that? Q.

Well, for bleaching our brands of flour. A.

What had it been used for? Q.

Well, a part of the machinery had been running, the agitators had been running and the electrifiers had been running with no current connected.

What had they been running for?

Well, because we did not care to throw the belts off more than anything else.

You were running these electrifiers but you were not making any use of the gas? A. No use of the gas, no sir.

Q. But you were making it, is that correct?

A. No, no indeed.

Q. Well, I did not want to misunderstand you. Now I ask you had those electrifiers been in use since last fall when you shut down that mill up to the time these gentlemen came there and took specimens of that gas?

A. They have been used, yes, sir.

Q. Now when and where and for what purpose?

A. For export flour.

Q. You had been bleaching export flour?

A. We had, yes, sir.

Q. Up to the time these gentlemen came there?

A. Not up to that time, but during this period since we started we have bleached some flour for export.

Q. From time to time then during this period you have bleached flour in there for export?

A. Two or three occasions that I know of.

### 1306 By the Court:

Q. You mean for export to Europe?

A. Yes, sir, or Interstate.

Q. What do you mean, Europe or America?

A. Yes, sir, that is what it is termed.

Q. International. You just used the word "Interstate" we lawyers understand that to mean a different thing.

### By Mr. Elliott:

Q. Do you mean by export that you have bleached flour to send abroad or into other states?

A. I presume that is where it went. I had nothing to do with the shipping of it. It was simply bleached for export.

Q. How do you know it was bleached for export?

A. That is our instructions, bleach for export.

Q. And it wouldn't make any difference where it went?

A. Not to me, no, sir.

Q. All you know, you bleached it, you don't know whether it was exported or not?

A. I do not further than the orders were to bleach for export.

Q. But you bleached it and don't know whether it was exported or not? A. I could not swear to it, no, sir.

Q. Now have you bleached any flour for domestic trade within that time? A. Not to my knowledge, no, sir.

Q. Well, would you have knowledge if you had done it?

A. Well, I presume that I—no, I would not, not remember, because I did not pay any attention to these orders, only that we got orders to bleach for a special occasion.

Q. I am not speaking about orders; I am asking if at that Rex mill since last November, up to the present time, you have bleached any flour for domestic use?

Well, do you mean-what do you mean? A.

Well home use, I mean home use in the State of Kansas or in Rosedale? 1307

A. Not to my knowledge, no sir.

Now I will ask you again would you know if that had been done, if it had been bleached for selling in the State of Kansas or in Rosedale?

Mr. Butler: I don't think that is cross-examination of anything brought out in the direct.

The Court: Go on, get through with it.

Well, the only way I could find out would be to see the shipping directions.

Q. I just mean as you saw or do you know?

A. No, I did not, no sir.

Well, all right. Now I understood you to say the difference in temperature and moisture and so forth, will affect the bleaching of flour within half an ampere, is that right?

Well, as near as I can judge, I measured very accurately, you understand what I mean, we have a standard to go by to run our patent and our clear flour.

Q. What is your standard patent flour, this Aristos?

Counsel for libelant objects to the question as irrelevant, immaterial and not cross-examination.

The Court: I don't see that that is cross-examination, how can that be.

Mr. Elliott: I want to find out if the conditions when these gentlemen got this gas were the same as when he was bleaching.

The Court: I would rather have the witness testify than make suggestion although you gentlemen make very good ones. Go on, lets get through.

What was the last question?

I understood you to say you had a standard for using Q. this machine for bleaching. Now what is it?

A. We have a standard of flour to go by. 1308

Q. But you were not speaking of the machine?

No. sir. A. Then let me ask you this, did you mean this, that according as temperature and moisture varies in the air you may adjust your arometer half an ampere one way or the other, that is what you meant was it?

A. That is what I mean, certainly.

Q. Now you are second miller at that Rex mill, are you?

A. Yes, sir.

Q. Who is the first miller? A. Mr. John T. Schramm.

Q. How do you spell his name? A. S-c-h-r-a-m-m. Q. Do you know where Mr. Schramm is?

Q. Do you know where Mr. Schram A. At the present time?

Q. Yes, sir.

A. Well, I think he has gone to lunch, if he has not been delayed, for some minutes.

Q. He is in Kansas City?

A. Yes, sir, Kansas City, Kansas.

At this point a recess was taken until 2 o'clock p. m.

1309 Friday p. m., June 17, 1910.

Pursuant to adjournment, Court met at 2 o'clock p. m., Friday, June 17, 1910, and proceeded with the trial of said cause further as follows:

C. E. Brewster resumed the witness stand.

The Court: Proceed, Mr. Elliott.

Mr. Elliott: I have no further questions.

Mr. Butler: That will be all, Mr. Brewster.

Witness Excused.

A. L. Winton, recalled, was examined by Mr. Butler, and testified further as follows:

Q. Since Mr. Winslow brought the flour which is in the sack marked Exhibit 13, from Castle, in this state, to this city, have you determined the amount of nitrite reacting material that it contains? A. I have.

Q. How much does it contain?

A. Calculated as nitrogen, 1.6 parts per million.

Q. Did Miss Wessling make some bread out of that flour?

A. She did.

Q. Did you test any of that bread, to ascertain how much nitrite reacting material it contained, if computed on the basis of sodium nitrite? A. I did.

Q. How many loaves did you test?

1310 A. I tested all the loaves that were baked; two baked by the domestic method, and two by the Koellner method.

Q. How much did you find in each loaf baked by the domestic method?

A. In one loaf, I found .82 of a milogram, calculated as sodium nitrite, in another, .92 of a milogram.

Q. How much did you find in each loaf, baked by the Koell-

ner method?

In one loaf, 1.16 milograms, and in the other, 1.43 milograms.

Did Miss Wessling make some biscuits out of this same Q.

flour, exhibit 13? A. She did.

Did you compute the amount of nitrite reacting material found in that? A. I did.

To the basis of nitrite of sodium? A. I did.

How much would be contained in a pound of the biscuits?

2.57 milograms, calculated as sodium nitrite. A.

Q. About what was the weight of each loaf of bread?

A. A little over a pound.

# Mr. Butler: That is all. Cross Examination

By Mr. Elliott:

Q. Doctor, my attention was called off, when you first answered. What flour were you dealing with, here?

Exhibit 13.

That is some of the seized flour, is it?

- Some of the seized flour that was obtained by Mr. Winslow since the trial commence.
- Mr. Butler: One of the two sacks, Mr. Elliott, Mr. Winslow brought up since the trial commenced, from Mr. Terry, down at Greencastle. 1311

By Mr. Elliott:

And you found 1.6 parts per million, calculated as-Q.

Nitrous nitrogen, in the flour. A.

And then, as I understand it, two loaves were made from that, by one method? A. And two by another method.

The domestic method? Q.

- Two by the domestic method, and two by the Koellner method.
- And the two you made by the domestic method, you found 82 and 92 milograms, respectively, calculated as sodium nitrite?

.82 and .92, calculated a sodium nitrite, per load.

Q. Then you made two bakings, of two loaves, by the Koellner method? Is that right? A. Yes.

Q. And you found 1.16 milograms, calculated as sodium nitrite and 1.43 milograms, calculated as sodium nitrite, respectively, in these two? A. Yes.

- Q. And it is obvious, is it not, that you found more of the nitrite reacting material by the Koellner method, remaining in the bread, than you did by the domestic method?
  - A. It is.
  - Q. Now, the 2.57. What did that refer to?

    A. That was the amount per pound of biscuit.

Q. Per pound of biscuit?

A. 2.57 milograms sodium nitrite, per pound of biscuit.

Q. You mean biscuits were baked, and then a pound of those biscuits, or a pound of the dough, before it was made into biscuits? A. Pound of the finished biscuit.

Q. How were those biscuits made?

A. They were made with baking powder.

1312 Q. Do you know what baking powder?

A. Royal baking powder.

Q. Were they made as separate biscuits, or in one loaf, or

one- A. (Interrupting) Separate biscuits,

- Q. Well, I just thought this, that perhaps you made the biscuits together, and then took it out and made separate biscuits?
  - A. I couldn't say whether they ran together-or not.
- Q. I didn't mean that. I just wanted to know what you had done.

Mr. Elliott: I think that is all.

Witness Excused.

Mr. Butler: I am not certain that all of the exhibits which have been used in connection with the testimony of witnesses have been formally offered in evidence. I think I do recall that the charts prepared by Doctor Mann were not offered, and I now want to offer the exhibits which have been used in connection with the testimony of the witnesses,

The Court: All which have been identified, and to which allusion has been made?

Mr. Butler: Yes, your Honor.

The Court: Very well. They will be admitted.

Mr. Butler: Doctor Boos has called my attention to the fact that the blood which he produced here will putrify if left here, and become offensive—at least offensive to us, unless something in the nature of a preservative be put into it.

The Court: Which is that?

Mr. Butler: That ox blood which was produced yesterday.

It has, already, apparently changed in appearance. It

1313 was introduced to illustrate the effect of nitrites.

The Court: I suppose it will decay at once, unless some preservative is put in it.

Mr. Helm: Do you want to preserve it, Mr. Butler?

Mr. Butler: I don't care for it, at all. It may be poured out, as far as I am concerned.

Mr. Elliott: I don't want it.

Mr. Butler: Then we will ask the janitor to pour it out.

The Court: What exhibits are these?

Mr. Butler: Those are two bottles.

The Court: The contents of two bottles, marked exhibits 48 and 49, are, by consent of parties on both sides, thrown out, and not further carried in the case, which is done on account of the fact that blood will decay, without some preservative be added.

Mr. Butler: I think probably many other of these substances like the biscuits, have already undergone and will probably continue to undergo changes, but not become offensive, I trust. I think that is our case, your Honor.

The Court: Government rests. Defendant calls its first witness.

Mr. Scarritt: If your Honor please, on account of the illness of Mr. Smith, who was the leading counsel in the case and had charge of the manner in which the witnesses were to be put on the stand, we are without his help or support, and even without his notes, now, and it turns out that two witnesses we want to put on first, will not be here until Monday morning, and we have thought that, if we could have some time for consultation and arrangement of our witnesses, we could probably save time. If it is insisted that we go ahead,

now, it would disarrange our program, to some extent.

4 I think possibly we could conserve time by adjourning,

for the day, at least, and possibly until Monday, if it suits the other side. In the meantime, we would like to ask, if your Honor please,—and this would save a good deal of testimony,—that the jury be allowed to go, in charge of one of the bailiffs, to visit one of these local Alsop machines, so that it would save the trouble of putting on witnesses to describe that machinery. If we could arrange with the Government to have them go, and have the bailiff to go with them, and let

them visit any one or more of these local machines, I think they could get a better idea, and a better notion of how it works, and what it is, than by any description that we can give them. In the meantime, we could be arranging our own matters, and be ready to go ahead by tomorrow morning, or Monday morning, as would suit the convenience of the Court and the gentlemen on the other side. I would like to say, if your Honor please, right in this connection, that we have had three weeks of pretty strenuous work, especially on the part of the Government's attorneys, and especially Mr. Butler, who has practically stood on the floor, here for three weeks, working hard, and I doubt not that a little rest would put him, probably, in a good humor, so we could get along faster, and I am sure that, on account of the absence of Mr. Smith, that we could arrange so that we could conserve time, and get along faster, probably eliminate a good deal of the testimony by going over the testimony that has already been introduced, so as to not repeat too much, and our side of the case, therefore, asks your Honor to give us a little time, and, in the meantime, to let the jury go and visit one of these Alsop processes.

The Court: Well, now, one-thing at a time. In so far as the jury going to see these Alsop processes, regardless 1315 of what counsel on the other side may say, I could not consent that they would go and see this mechanism, or apparatus, in the light of your statement, that they could go there, and investigate it, and look it over, and thereby shorten the evidence, for the reason that you cannot substitute evidence in that way, and, in the event of this case being carried by either side or both sides to an appellate tribunal, it would be utterly and absolutely impossible to carry such information forward. I will not consent to that. That is to say, I cannot consent that the jury may go there and look it over, and that act as a substitute for evidence here in open Court.

Mr. Scarritt: Well, we can produce the evidence in open court, also.

The Court: Well, you have said, in order that you might dispense with some witnesses.

Mr. Scarritt: No, I also said in order that they might see the machine working, so they would know what we were talking about.

The Court: In the second place, if the jury would go and look at it, unless they have got better eye-sight than I have, they would not think it was worth the admission fee, after going. There is nothing to see, except you lift the cover and look

into a glass, and you see a little electrical storm in there, and then you see the two-inch pipe, or some other size, over in another part of the building, and there you see an agitator. From the outside you can't see it, at all-a great big, wooden drum,-and you see the flour pouring out of the other end, bleached. Now, is there anything else to see? If there is, I have sat here for three weeks for nothing, and I have gone to

one of these mills for nothing. Now, what did I over-

1316 look?

Mr. Scarritt: You overlooked the smell.

The Court: No, I don't see the smell. Now, what did I overlook.

Mr. Scarritt: You asked what you overlooked, and I think you overlooked the smell.

The Court: Well, what did I overlook?

Mr. Scarritt: Of course, I think your Honor is probably describing the machine you saw, and I think it is a pretty good description, so far as it goes, but there is testimony here about the pungent smells about these mills, and about the color of the gas, and about the stain of the gas, all of which the jury can verify. If that is true they could verify it.

The Court: Well, we will see about that.

Mr. Scarritt: They could verify it.

The Court: And use it as evidence?

Mr. Scarritt: They could use it.

The Court: And say whether somebody testified correctly?

Mr. Scarritt: I recognize, your Honor, it is in the discretion of the court to permit that, but I also know it is often done -very often done, where juries are allowed to go to the scene of the accident, or a building, or machinery, where it is in issue, to determine for themselves which side is telling the truth.

The Court: Oh, no. I never heard of that in my life. never have; you may have; but I never have.

Mr. Scarritt: Well, your Honor, it is a very common practice in our courts.

The Court: On the contrary, the rule in all jurisdictions with which I have any familiarity, is, for the Court to tell the jury in most specific terms that any fact they witness 1317 cannot be regarded as evidence.

Mr. Scarritt: Yes, unless it is under the authority of the Court.

The Court: No, even then. If I let this jury go there, I will tell them in the most specific terms that no fact gained, nothing saw, nothing heard, can, under any circumstances, be regarded or used in the slightest degree as evidence. I will be compelled to tell the jury that. Of course, I know it is exceedingly difficult for a jury to observe such an admonition from the Court. It is hard to keep from that which we did know, that which we hear testified to. It is very difficult.

Mr. Scarritt: I would like to state this, if your Honor please, to show why we make this offer at this time. Your Honor will understand, we assumed, at the time we started out in this case, that there would be experiments made here, and that the jury would be permitted to go and visit one of these machines, and therefore we stated to the jury that we would ask that, and we now ask it.

The Court: Well, we will see about that. I don't want to be put in the position of trying to suppress some fact in this trial, but, under no circumstances, will I accede to your request, that what they may see or hear may be used as evidence. I will never consent to that, either by agreement of parties, or otherwise. The only purpose for which a jury ever goes to visit the premises, is that they may make perhaps the better application of that which is in evidence, and not for the purpose of gaining some fact. Otherwise, you would turn a trial into a town meeting, and you would lose control over your record, and there is no possible way for review by an appellate tribunal.

That is the way that I understand it.

1318 Thereupon the Court ordered a postponement of the further hearing of said cause, until Monday a. m., June 20, 1910.

Morning Session.

Kansas City, Missouri, Monday, June 20, 1910.

Court met pursuant to adjournment and the further hearing of this cause was resumed as follows, to-wit:

Testimony on the part of Claimant.

Claimant, to sustain the issues upon its part, offered and introduced evidence as follows, to-wit:

A. C. Leflang, recalled as a witness on the part of claimant, testified as follows:

## **Direct Examination**

By Judge Scarritt:

Q. I believe you have already testified that you are the manager of the Lexington Mill? A. I have.

Q. By which the flour seized in this case was produced?

Yes, sir. A.

Q. And this flour which was seized in this case as I understand you sold to Mr. Terry? A. Yes, sir.

1319 Q. And did you sell it to him with a guaranty? We did. A.

Mr. Butler: Wait a moment. I think that is immaterial and irrelevant.

The Court: That has all been gone over, and they made the substitution and they took the flour and thereby became reinvested with the title.

Judge Scarritt: He testified that he got the flour.

The Court: Yes, and the title was reinvested in the defendent.

Judge Scarritt: We can get along faster after we get through these preliminary matters.

The Court: Go on.

By Judge Scarritt:

Q. Now, what was this flour made out of, what kind of wheat?

Well, Nebraska No. 2 hard winter wheat. A.

I believe it has been testified here that that was the best 0. wheat in Nebraska?

Yes. A.

Highest grade of wheat? Q.

Counsel for libelant objected to the question as leading and suggestive.

The Court: It is very leading, but go on.

Judge Scarritt: I would like for you to pass on the question. It has already been testified here. The gentlemen on the other side not only led this witness but every witness he had right straight through every examination he had, and these are simply preliminary matters.

- Q. Now, just state to the jury-I believe it has been testified this is fifty-nine pounds wheat to the bushel?
  - A. Yes.
- Now, what do you mean by fifty-nine pounds wheat, a O. bushel?

A. Why, fifty-nine pound wheat is our best No. 2 hard 1320 wheat raised in Nebraska and in weight that weights 59 pounds or better, grades No. 2 in all the terminal markets in this country.

Q. Now, when does it weight 59 pounds?

A. Well, when it is sound, bright and has not been damaged.

Q. At the mill? A. When we take it.

Q. What is the weight of it after you get it ready for milling?

A. When we buy it on the scales it will average 59 pounds or better; we buy lots of wheat that weighs 60 and 61 pounds.

### By the Court:

Q. It averages 59?

A. Well, that is the minimum.

### By the Court:

Q. Well, what do you mean by the minimum; you said average, which is it?

A. Well, this is the minimum weight; it will average, I think more than 59 pounds.

### By Mr. Scarritt:

Q. Does it weigh that when the farmer brings it to you or when you get it ready to put in the mill?

A. That is when the farmer brings it to us.

Q. What does it weigh when you get ready to put in it the mill?

A. After we clean it and scour it and clean out the screenings it will weigh 61 pounds.

Q. So when you say 59 pounds you mean 59 pounds at the time the farmer brought it to you and you bought from him?

A. Yes, with the dirt and chaff all in.

Q. Now, just explain to the jury the process or processes through which this wheat went when it was developed into this flour that was seized? A. I have some samples.

Q. Have you got the samples here with you?

A. Yes, sir.

Q. Well, let's see them and get through with them as quick as we can. Have you got the sample of the wheat as you bought it from the farmer?

1321 A. Yes, sir.

Q. Let me have that first. Now, this bottle which I hold in my hand and which is full of wheat, marked Claimant's Exhibit No. 211, as I understand, is this wheat out of which this flour was made, that is the same kind of wheat?

A. The same kind of wheat.

Counsel for libelant objected to the question as leading and suggestive.

The Court: It is leading.

Judge Scarritt: Yes, sir, very leading. Here is the evidence right here. All we want to do is to identify. If he is going to make these objections it will take three weeks to get through with this case, and we did not make but two of this kind of objection, just to put it in the record.

The Court: You can get at that in a half a minute. Is that the same identical wheat as this flour which was sold to Terry was made from or not, or is it a like wheat?

A. Why, it is a like wheat, yes a like wheat.

By Judge Scarritt:

Q. A like wheat?
 A. Yes, it is not the identical wheat, it is a like wheat.

Q. Of course it is not the identical wheat, why, anybody would know that had any sense.

The Court: No, it may not have been ground entirely at one time, I don't know.

By Judge Scarritt:

Q. Now, that is the wheat as you brought it from the farmer? A. Yes, sir.

Judge Scarritt: I would like to show that to the jury.

(Exhibit 211 was handed to the jury for inspection.)

Q. Now, let me see the next grade—when you took the chaff out, was it?

A. We were just taking out the chaff stuff and sticks

1322 and a little of the chaff then.

Q. Where is the chaff, have you got that?

A. I have not got it; that is in very coarse stuff, I did not bring that with me, and I got the other chaff, however.

Q. Well, what is the first thing you took out, that is, that amounts to anything?

A. Well, we took that out, the fan. Q. Took that out of the wheat?

A. Yes, and that goes through the sieves and also drawn out by the fans.

Q. Now, what do you call this chaff?

A. That is chaff and dust.

Q. Chaff and dust that you took out of the wheat that you produce here in Exhibit No. 211?

A. Yes, sir.

(The sample just identified by the witness was marked "Claimant's Exhibit 212".)

Q. You do that by air, do you? A. By air, yes, sir.

Q. By applying the air through the wheat?

A. Yes, sir, it is drawn through.

Q. Drawn through the wheat. Now, is this,—the bottle that I hold in my hand—the next thing that you took out?

A. Yes, sir, took the screening out.

Q. What do you call that?

A. Screenings, wheat screenings.

(The sample identified by the witness was marked "Claimant's Exhibit 213".)

Q. Now, this chaff and these screenings are thrown away, are they not? A. Well, yes.

Q. As far as the flour is concerned?

1323 A. So far as the flour is concerned they are sold for feed, that is, the screenings are.

2. What is the next thing you took out?

A. Well, that is the wheat after the screenings are taken out.

Q. What is this?

A. That is after it has been through the milling separator.

Q. Before this or after?

A. Yes, that is the wheat that is left.

(The sample identified by the witness was marked "Claimant's Exhibit 214".)

Q. Now, Exhibit 214 is the result after you have taken the part of the chaff out of the wheat and from the 213?

A. No, and taken 213 out too.

Q. And taken what? A. Taken those two out.

Q. 213? A. Taken this out, those two out.

Q. And that leaves this? A. Yes, sir.

- Q. And you took this out—those other two out, and that leaves this? A. Yes, sir.
  - Q. You are reducing it? A. To the clean wheat.

Q. Clean wheat? A. Yes, sir. Q. Now, what is the next one?

- A. Then we scour it in the scouring machine and we take that off.
- Q. Then 214 is after you have taken out the wheat which is in 213 and left what is in 214, and then you get what is in 215 out of that still, do you? A. Yes, sir.

Q. In order to more thoroughly clean the wheat?

1324 A. Yes, dirt and bran and dirt that is on the outside of the wheat kernel.

Q. Now, does that leave the wheat that you make the flour out of? A. No, sir.

Q. It does not?

A. We wet it down and let it stand in a bin for several hours to temper, and it has a fine bran on the outside that is called, millers term it a Bee Wing bran, it swells up, and we scour it over, another hard scour, and we have this product out of it?

What is this?

That is the wheat before it is scoured the second time, that is before it is tempered.

Q. Just before it is tempered?

Yes, sir. A.

Q. Now, this is just before it is tempered?

Yes, sir. A.

Then how do you temper it? Q.

We put a little water on the wheat as it runs to the bin and it stands in the bin for several hours and toughens the bran, loosens up some of the loose outside branny particles, we then scour that off, and the wheat is ready for the rolls.

Have you got these scourings?

Yes, sir, those are lighter in color than the others. Then when you temper it and scour it you get this out Q. of it? A. Yes, sir.

(The sample referred to was marked "Claimant's Exhibit 217.")

Now, after going through all of these processes have you got the wheat ready for the mill? A. I have.

Now, Exhibit 218 contains the wheat out of which the

flour is ground? A. 'Yes, sir.

Q. That is after going through all these processes of 1325 cleaning and tempering? A. Yes, sir.

Q. And preparing for the mill? A. Yes, sir.

And originally it was No. 2 hard Nebraska wheat?

Yes, sir. A.

Now, after you have got all of this out of it and have gone through all of these processes of cleaning and reducing the wheat to the quality which we finally get it what would it weigh then? A. Why, it would weigh 61 or 62 pounds.

To a bushel? A. Yes.

Now, have you got the result of the grinding of the wheat into flour?

I have. Which do you want, the flour first, or bran?

The flour,-no, let's take out of it everything; what do you get out of it first?

Well, it comes out at different times, bran is the

coarsest feed taken out.

Q. Exhibit 219 represents the bran that comes out of this wheat in the process of grinding the wheat into flour?

A. It does.

Q. Now, what else comes out? A. Then we get the shorts.

Q. I notice that we have got two exhibits marked 214, the one I hold in my right hand was taken out of the one I hold in my left hand? A. Yes.

Judge Scarritt: Call the one I hold in my left hand 214, and mark this 214½; no, instead, make that 215. Now, the 220 is the additional product that you get out of the wheat in making it into flour? A. Yes, sir.

1326 Q. Now, after removing the bran and the shorts shown by Exhibits 219 and 220 what do you get?

1. We have a low grade flour then.

Q. Have a low grade flour? A. Yes, sir.
Q. How many grades do you make?

A. Why, we make a first grade or patent, and clears, and we have never considered low grade flour, that is the strean, we have never counted it as a flour.

Q. As a commercial flour? A. As a commercial flour.

Q. But this is the low grade?

A. That is the low grade that we make here.
Q. What has been called here low grade flour?

A. Yes, sir.

Q. That is Exhibit 221. Now, what other flour do you get?

A. And we get our clear.

Q. Is this before it is bleached?

A. Yes, sir; we never bleach the clear.

Q. This is unbleached clear flour? A. Unbleached clears. Q. You mean by clear what those gentlemen talk about being flour that you don't put in your patent outside of the bran and the short?

A. Yes, sir, bran, short and low grade.

Q. (Handing witness Exhibit 222.) Now, this is the clear which you do not bleach? A. We do not bleach.

Q. What is next? A. Well, the unbleached patent. Q. Now, what is 223, the unbleached patent flour?

A. Unbleached patent, yes, sir.

Q. What you call patent? A. Yes, sir.

1327 Q. The unbleached? A. Yes, sir.

Q. Now, have you got the bleached? A. Yes.

Q. The same thing? A. Yes.

Q. This is the flour in Exhibit 223 which I hold in my left hand before it passes through the agitator? A. Yes, sir.

Q. And have been bleached by this process, the Alsop process? A. Yes.

Q. And the flour which I hold in my right hand, marked

224, is the same flour bleached, is it? A. Yes, sir.

Q. There is the bleached and unbleached flour. Now, is the flour that was seized in this case produced by the same methods and the same processes exactly as you have described here?

A.

Now, as I understand, this flour was bleached by the Q. Alsop process? A. Yes, sir.

Just describe that process. A. Describe it?

Yes.

A. Why the electric current is led to the electrifier where the making and breaking of the arc changes the air in some way, and that air is conducted then to the tank by pipes, a storage or receiver tank, and from there it is piped to the agitator where the flour and air are mingled by the rotation of the wings-arms that are rotated inside of the drum.

How far is what you call the generator or the electrifier from the agitator where this air comes in contact with the

flour? A. Well, the pipe is about thirty feet long.

That is, there is a pipe about thirty feet long? Yes, from the electrifier to the agitator.

Q. Electrifler to the agitator? A. Yes, sir. Nothing touches the flour until it gets to the agita-1328 tor, does it? A. Nothing touches the flour.

In the way of this machinery? A. No, no.

It is only when the flour is going through the agitator that this process is applied to it at all? A. Yes, sir.

Q. How big is that agitator?

Why, it is about, oh, six or seven feet long and about twenty-four or thirty inches in diameter.

Does it lie horizontally or perpendicularly? Q.

It is horizontal.

And the flour sifts into it and these wheels drive it out

the other end? A. Yes.

- Q. The air from this pipe which is connected with the electrifier thirty feet off comes through that agitator six or seven feet long while the flour is going through the same agitator?
  - Yes, sir. A.
  - And the flour is mixed up like snow by these wheels? Q.

Yes, sir. A.

Now, is there anything put in the pipe or the agitator or anywhere connected with the machinery except the air?

There isn't anything else. A.

Nothing else whatever goes through that agitator, is produced by the air passing through the electricity?

A. Yes, sir.

Q. Now, tell the jury the amount of this electricity, how far are these electrodes that they are talking about apart, how far do they come apart when they are working back and forth?

A. Why, they come apart about an inch.

- Q. About an inch?
- A. Yes, they come together and make the break in this manner.

Q. You mean they go about an inch?

1329 A. No, they touch, they touch and the current—Q. Now, when they touch they are right together?

A. When they touch they are right together,

Q. How far do they separate before they come back?

A. They separate about an inch, I think.

Q. They separate about an inch, then this great flaming are is just about an inch long? A. Yes, sir.

Q. That is all, isn't it? A. Yes.

- Q. And what is the size of it? A. Those electrodes?
- Q. No, no, not the electrodes—well, tell us about the electrodes.
- A. The electrodes, that is the two copper points that touch, that makes the electric connection, produce the flow of current in the arc.

Q. What is the size of those with reference to your finger?

A. Oh-

Q. The size of your thumb?

A. Yes, a little larger than your thumb.

Q. A little larger than your thumb?

A. Yes, not very much larger. Q. Then those electrodes—

A. When they touch, why, then there is an arc and a flash from them.

Q. When they are pulled apart?

A. When they are pulled apart they are.

Q. What you call the arc is the flash of electricity?

A. Yes, sir.

Q. An inch long between the ends of the electrodes when they are the widest apart? A. Yes, sir.

Q. Is that right? A. Yes, sir.

Q. In other words, there is only about an inch between when they are the widest apart, that is your best judg-1330 ment? A. Yes, I think that is.

Q. Now, then, how big is this flame that they talk

about?

A. Well, the flame, there is an arc in the center and there is a little flash or roar around the outside that just works, pulls apart.

Q. That is, there is a spark of light?

A. There is a spark of lightning in the center, there is the arc in the center and the flash on the sides.

Q. There is a spark of light, how much is that just like a thread. A. Yes, a heavy thread.

Just like a heavy thread, any bigger than that? Q.

Well, I don't know. A.

- You have seen it? Q Yes, it has an appearance larger than a string of thread. A.
- I am talking about this light in the center there. Q. Yes, you are talking about the arc itself only. A.

How big is it?

Q. Oh, it is one-thirty-second of an inch, something like A. that.

One-thirty-second of an inch? A. Yes, sir. Q.

In diameter or across it or whatever it is? A. Q. Now, around that there is a little blue air, you say?

Yes, sir. A.

Q. How big is that? A. An inch in diameter.

An inch in diameter?

- That is the outside, I think it is a kind of a daze flare Q. from the contact.
- Therefore this flaming arc, this great thing that they call the electrical flaming arcs in there, is about an inch long and about an inch thick when you take in all the air that shows around it that is blue, is that right? 1331

A. I think so, yes, sir.

And that is thirty feet away from your agitator?

Yes, sir.

Q. And the air that passes over or through or under or around this flaming arc, this little inch flaming arc, goes into this pipe and is carried thirty feet to this agitator? A. Yes.

Now, does it go through that agitator like a whirlwind

or does it go smoothly or gently?

Oh, it is just a puff, you know, as the pump works, at very light pump.

Have you ever tried your hand in it? A. Yes. Q.

Well, does it blow your hand out of the agitator, or anything of that kind? A. No. Q. Is it very strong? A. No, it is very light.

Very light? A. Oh, very light pressure.

Q. Just like a summer zephyr going through there? Q.

Yes. A.

No pressure in it at all? A. No.

Q. Now, then, how long have you been in the milling busi-

A. Fourteen years. ness?

Q. During that time you have had occasion to examine wheat and flour and baked bread and performed all the ordinary duties and functions of a managing and head miller, have you? A. Well, as a managing miller I have, yes.

Q. That is, you have been in the business? A. Yes.

Q. Have you noted during that time the different grades of wheat and the different grades of flour, the qualities of wheat and the qualities of flour and of bread made from flour?

A. I have.

Q. Have you during your milling experience determined for yourself by your experience and your observation and the application of the experience and observation that you have had, determined the strength and quality of flour?

A. I have.

Q. And the bread made from flour? A. Yes, sir.

1332 Q. Now, you can state to the jury whether the flour in question here, made by this process that you have described and bleached by this machinery which you have described, has been thereby in any way reduced in its quality or its strength? A. It has not.

Q. Now, has the flour by reason of this process in any way, in your opinion as a miller, a practical flour man, been dam-

aged? A. No.

Q. What is the effect as to whether inferiority in flour is concealed or made more apparent by this process of bleaching?

Counsel for libelant objected to the question as leading and calling for a conclusion of the witness.

Judge Scarritt: I withdraw the question.

Q. Now, you may tell the jury whether or not the flour is rendered inferior by this process from what it was before, in your opinion as a miller?

Counsel for libelant made the same objection; the court sustained the objection; to which ruling of the court claimant then and there duly excepted.

Q. Could you ascertain by inspection whether a flour was inferior after the process from what it was before?

A. Yes, sir.

Q. Was this flour inferior after the process from what it was before? A. It was not.

Counsel for libelant renewed the same objection.

The Court: Objection is sustained on the ground that the witness has not shown himself to have any knowledge of this chemical change in the air as applied to the wheat.

Q. Well, I am not speaking about the chemical change; I am talking about the inferiority which appears in the flour before or after, how could you tell whether flour was inferior or not after any process of milling?

A. Why, by its appearance and its baking qualities.

Q. What effect does this process have on the flour with reference to concealing or revealing the defects in the flour?

A. Well, if there is any inferiority there due to branny

particles or specks, it discloses them more readily.

Q. That is, it reveals the defects? A. Yes.

Q. Instead of concealing them if there are any there?

A. It does.

Q. Now, in this mill of yours could you smell the gas in this machine or coming from this machine?

A. I have often tried to smell it at the electrifier and could

not.

Q. Have you tried to breathe or attempt to breathe it, and smell it? A. Yes, I have.

Q. Could you notice any offensive or pungent odor about it

at all?

- A. I could not; the only place I have ever noticed any odor is in the flour bin itself, could notice a slight odor in there, never on the packing floor or in the room where the electrifier is located.
- Q. Have you examined to see whether there is any color in what they call this gas in the agitator? A. I never.

Q. Or anywhere else?

A. I never examined the gas in the agitator itself, but I have at the electrifier opened up a plug that will let the full amount of the air blow out and I looked at it.

Q. Could you see the gas? A. I could not.

Q. What relation does it bear as to color with the air around it? A. Why, I could not detect any difference.

Q. Now, you say you had pipes running from the agitator or the electrifier to the agitator. How long were those pipes in use, or had they been in use?

A. Why, we have had part of the pipe in use five years and a half, and when we moved there was some of the couplings changed, or rather not the couplings so much as

their nipples that were changed, but the other pipe has been in use all that time.

Q. What do you mean by "when we moved"?

A. Well, we had the electrifier first in the engine room, then we moved it to the second floor of the mill to have it closer to the work for convenience,

Q. But your pipes, as I understand, connecting your agitator with your electrifier with your agitator have been in con-

stant use for five and a half years? A. Yes, sir.

Q. Do they show any corroding or eating up with gas, or anything of that kind? A. They show a slight rusting.

Q. A natural rust? A. Yes.

Q. Have you got any of these pipes here? A. I have.

Q. Let's see them.

## (Witness produces section of pipe.)

Q. Is that a piece of your pipe that has been in use for five years and a half? A. Yes, sir, it is.

Q. Is that as good or better or worse than the balance of it?

A. Why, I think that is representative.

Q. Just the same? A. Yes.

- Q. Where was this in reference to the agitator or the electrifier?
  - A. That was between the agitator and the reservoir.

Q. Between the agitator and the reservoir?

A. And the storage tank.

Q. That is the electrifier and the receiver or storage tank, and then comes the agitator? A. The agitator, yes, sir.

Q. And this was between the agitator?

A. And the storage tank.

Q. Storage tank.

(The piece of pipe produced by the witness was marked "Claimant's Exhibit 225".)

Q. Has this pipe ever been renewed or cleaned or manipulated in any way at all?

A. Why, we clean those pipes out about once a year, there

is some dust that collects in there.

1335 Q. Oh, I mean inside, I mean in taking it out at this time? A. Oh, no.

Q. Just as you took it out at the mill it has been there and you have been using it for five and a half years? A. Oh, yes.

Q. You got any other part of it?

A. I have got a rubber hose that has been in use a year and a half.

Q. You have a rubber hose, did you move a year and a half

ago, is that when you moved?

A. Why, we put in another electrifier at that time and we changed the piping and they changed the hose at the same time in order to get it to fit.

Q. What became of the old hose?

A. It was thrown away; it did not fit the piping.

Q. (The piece of hose produced by the witness was marked "Claimant's Exhibit 226".)

Q. I notice this is a cotton hose? A. Rubber lined.

Q. Rubber lined cotton hose, that is a thin lining of rubber there? A. Yes, sir.

Q. It is not as thick as the ordinary rubber—some of it, yes, I guess it is some of it, but that has been in use for a year and a half; where was that located with reference to the—

A. That is right by the electrifier, it runs right out, there is an elbow and it goes right up into the pipes that is put up for electrical purposes, electrical insulation.

Q. This was connected with the electrifier and the pipe that

ran to the agitator? A. Yes.

Q. And that has been in use for a year and a half?

A. Yes, sir.

Q. How long had the hose that you had on there previously been in use?

A. Well, there was a hose that we had in the engine room, we had a piece on there about two and a half years, and then we moved the electrifier up into the mill, put it in a room, and there was a piece up there about a year and a half.

1336 Q. Did you ever take any of it out because it was worn

out? A. No, we did not.

Q. Or eaten up with gas, or anything of that kind?

A. No.

Q. Now, you say you have been in the business for fourteen years. Do you know whether or not there is a standard for what they call patent flour?

A. I never heard of one; I think that every mill established its own standard, their first grade, they term it patent.

Q. Yes, that is every mill—whatever a miller thinks is his patent flour he brands it patent?

A. He brands it patent, and that is his first grade.

Q. Now, then, Mr. Butler has made a great spectacular display here about "Fancy Patent Lexington Cream"—that is the brand that you put on that particular flour, isn't it?

A. It is.

Q. How long have you had that brand on that flour?

A. Used that brand about twelve years.

Q. The same brand? A. The same brand.

Q. Is there anybody else that you know of that uses that brand?

A. I do not know of anyone else using it.

Q. Is there any standard outside of your own standard for "Fancy Patent Lexington Cream Flour"?

A. I do not know of any.

Q. Don't know of any. Is that fancy patent brand of yours known among the trade? A. It is.

Q. Do they know what they are getting when they get that flour? A. They do.

Counsel for libelant objected to the question as calling for the conclusion of the witness and immaterial and irrelevant. By the Court:

Q. If I go down to a grocery store in my town and see a bag of flour marked "patent" and buy, some name, I don't know anything about what mill it comes from, do I know anything about what I am getting or not?

A. Well, you know that you are getting—I suppose from that mill that you would be getting their first grade flour; whether it would give you satisfaction or not would depend entirely upon the method—

Q. And if I don't know what mill it comes from I don't

know anything about it, is that it?

A. Yes, that is true.

By Judge Scarritt, resuming:

Q. That is evident. This brand of Fancy Patent that you have that has been seized in this case has been on the market for twelve years, hasn't it?

Counsel for libelant objected to the question as argumentative and leading.

The Court: It is very leading, but he may answer.

A. It has been.

Q. I will ask you if during that time you have used the same grade of flour to make this kind—the same grade of wheat to make this kind of flour?

A. Well, the first two years in Nebraska we had hard spring wheat and that run out in Nebraska, and for the last ten years we have had the hard winter wheat that is grown in Nebraska.

Q. And you made this flour out of that wheat?

A. Yes.

Q. And with the same processes that you have explained here to the jury? A. Yes, sir.

Q. In the same way? A. Yes.

Q. Now, has that flour, to your knowledge, become known over the country among the trade that you sell it to?

A. It has.

Q. And when a dealer orders from you the Fancy Patent Cream Lexington Flour he knows what he is getting?

A. Yes, sir.

Q. When he orders from Mr. Ballard his White Rose why, he may know that he is getting his patent from him?

A. Yes, sir.

Q. But there is no standard for patent flour?

1338 A. There is not.

Q. Now, from your experience as a miller—I will ask you before I leave that, have you ever had any complaint about this flour after you bleached it?

Counsel for the libelant objected to the question as immaterial.

The Court sustained the objection; to which ruling of the court claimant then and there duly excepted.

By Judge Scarritt:

- Q. I have forgotten whether it was you or not, but my recollection is that Mr. Butler asked you with reference to the complaint made against this or some other flour; is that correct?
  - A. No.
  - Q. In one of his frequent recalls?
  - A. No.
  - Q. It was not made?
  - A. I don't remember anything.
- Q. Now, from your knowledge of flour and wheat can you tell the jury whether or not there is any difference in the quality or strength or size of loaf, or in any other way except in color, and not even in color, between flour bleached by the Alsop process and flour bleached, aged flour, or flour bleached by nature?

Counsel for the libelant objected to the question as calling for a conclusion.

The Court: Well, he may answer.

A. Why, flour bleached by the Alsop-

The Court: Oh, answer the question,

- A. Why, there is a slight difference, depending upon the time that it has been aging naturally by nature,
  - Q. Well, I am talking about flour aged by nature.

A. Yes.

- To the same extent that flour is bleached by this process? A. It would be the same.
- 1339 Q. Well, now, does nature age flour to the same extent that this process does, in time?

Mr. Butler: Objected to on the ground that Judge Scarritt's question assumes that this witness has testified that this bleaching process ages flour, and he has not testified to anything of the kind, and I don't think that he will because I don't think his conclusion would be permitted on that score.

The Court: Well, he may answer.

Q. If it doesn't do anything, why say so, if it does, say so.

A. What is that question?

Q. The question is whether there is any difference between flour that is bleached by the Alsop process and the same flour that is bleached to the same extent by nature?

A. There is no difference.

Q. It is the same in quality and strength?

A. Yes, sir.

The Court: Color.

Q. And color?

A. Yes, if it ages the same length of time it will have the same color.

#### By the Court:

Q. The same length of time?

A. That is, I mean if you give it time enough to age it will give you the same color.

By Judge Scarritt:

Q. That is, if you give it time enough to age to the same extent that the bleaching process does?

A. Yes, sir.

Q. It will have the same color and the same quality?

A. It will.

Q. Now does the bleaching process, from your experience and knowledge as a miller have the effect of aging flour?

A. It does.

Q. Does it have the same effect as aging flour by nature?

A. It does.

Q. Did you ever notice any difference between the quality or the strength or the color of flour that was bleached 1340 in this way by the Alsop process and flour that is bleach-

ed to the same extent by nature?

A. I have never made any careful examination along those lines, but it would be my opinion that it would be the same.

Q. It would be the same? A. Yes.

Q. Did you ever have any experience in making bread or in testing the flour, that is, bleached flour, in the bread, or examining it, investigating it?

A. No extensive experience, no.

Q. Well, you follow that up as a miller, don't you?

A. Yes

Q. What effect does it have on bread as to quality and strength as compared with the bleached flour by nature?

A. Why, it has the same effect on the quality, that is, it improves the quality of it and improves the color of the bread

and it makes the same size loaves.

Q. Makes the same size loaf. Now, then, what effect does the bleaching of this wheat that you have been—flour from this wheat that you have been talking about, have upon the market as to the price of the white flour?

A. Well, when we can bleach our hard winter wheat flours by the Alsop process, and age them, and get the proper color, we can sell upon the markets of the world in competition with the-

Mr. Butler: I move to strike out his answer as not responsive to the question.

The Court: Well, go on; I suppose he is getting to it; anyway go on.

A. In competition with the other white wheat flours.

By the Court:

- Q. Now, what do you mean, you mean that you can sell your winter wheat flour or spring wheat flour, is that what you mean? A. No, sir, I do not.
- Q. What do you mean? 1341 A. We sell it upon its merits, but if it has a proper

color it commands-well, it will go to places where people-

Don't know the difference or what?

They know the difference, because it makes a different class of bread.

The Court: All right, go on.

By Judge Scarritt, resuming:

Q. Now, you get right there, let's continue that a little further. What is the effect of an attempt to make bread out of unbleached new flour, spring wheat flour, or any other wheat?

Mr. Butler: I object to that as immaterial and irrelevant.

The Court: Yes, talk about winter wheat flour. However, let's get through, I want to know what you bleach the flour for; get on and tell it.

Judge Scarritt: If your Honor please, we will get around to that and show you all about that.

The Court: What do you bleach the flour for; go on and answer.

Judge Scarritt: Please don't crowd us right at the start; we want to get straightened out.

The Court: Go on.

Q. Why do you bleach the flour?

A. Why, we bleach it to age it, and to improve the color, and people want a white flour, they want white bread, and it enables us to sell the flour quickly, place it upon the market without storage, and to sell the flour at a lower price by not having to hold it thirty or sixty days in the warehouse; it saves the necessity of storage.

By the Court:

Q. Insurance? A. Yes, sir.

By Judge Scarritt:

And all that sort of thing. In other words, you are not paying for the Alsop process just for fun?

1342 A. No, or any other.

- Q. If you didn't believe it rendered it better you would not pay for that. By the way, one question I want to ask you. What was the date that you made this flour that was seized in this case.
- A. I think it was March 30 or March 31; it was made at night.
- Q. Now, subsequent to that time did you-when, subsequent to that time, did you change your mill, sharpen your rolls? A. We changed our rolls after that.

Q. After that time?

- A. Yes, sir, we had them recorrugated. What do you mean by recorrugated?
- Regrind them, sent them down to the people that do that work, they put new corrugations on the rolls, that is, kept corrugations in them in a certain way and sharpen them up.

Q. When they are newly corrugated they make a little

better flour, don't they?

A. Tney make a little better flour.

# Cross-Examination

By Mr. Butler:

Q. When did you fix up these exhibits that have been offered in evidence in your examination, or did you fix them up, or did you have somebody else do it for you?

A. Why, I got the pipe a week ago, and I got the other

examples several weeks ago.

Q. Before or after Mr. Tucker testified in this lawsuit. Mr. Tucker, your miller?

Q. Yes,—well, now, let's see, I think it was after he testified.

After this trial commenced you fixed up these exhibits for the purpose of bringing them down here to show what they do show to the court and jury?

1343 A. Yes, sir.

Do you believe that the bleaching of the flour by this gas improves its nutrition value? A. I do not.

It is stated in this patent which is in evidence in this case that the bleaching increases the water contents. Do you believe that?

A. Why, I never examined it for that purpose.

Q. It states that it increases the proteins from 13 to 26 per cent, disregarding fractions; do you believe that?

A. Why, I have no way of determining it one way or the

other.

Q. I know, but you have been using this for five years?

A. Yes.

Q. And do you know whether or not it makes the flour of greater nutritive value; do you believe that it does?

A. No, I do not expect that, it dries the flour slightly.

Q. Then you think that where it says it adds water to it he is mistaken in the patent, do you? A. Yes, sir.

Q. So the statement that it adds water is false; the state-

ment that it makes it more nutritive is false?

Judge Scarritt: I object to that. The patent is not in question here.

Mr. Butler: No, but it is in evidence here.

Judge Scarritt: I know it is, but the hearsay evidence in the patent is not in evidence here.

The Court: He may answer.

Q. So the statement in this patent to the effect that the nutritive value is increased is false, in your judgment, is it not?

A. Well,-

Judge Scarritt: I object to that as not proper cross-examination or expert testimony.

1344 The Court: He may answer.

A. I don't think that it is correct that it increases the proteins; I do not believe you can increase or decrease them, from what I know.

Q. I want you to answer my question. Now, Judge Scarritt helped you very much by leading, but I am not going to;

I am going to take your opinion.

A. That is all right.

Q. I want you to answer my question: Do you believe that statement to be true or false that it increases the nutritive value of flour?

A. Well, I answered that before; I don't think that it increases the nutritive value of the flour except that it dries the flour very slightly.

Q. Well, does that increase its nutritive value?

A. Well, yes, I think it would.

Q. You think it does, but you think that the statement that it doubles the protein value of the flour is absolutely a humbug and false, don't you, right on its face?

Counsel for the claimant objected.

Q. Now, don't you, Mr. Leflang?

The Court: I don't think you ought to use that language, but you may answer whether it increases or not.

- A. It does not increase it, at least I don't think it increases it.
- Q. You find a statement here in this patent to the effect that it makes the flour a dead white as distinguished from the yellowish or creamy white with natural aging, is that true or false? A. It does not make it dead white.

Q. So that statement is false in the patent. Does bleaching your flour enable you to get more money for it?

1345 A. It does not.

Q. Not a cent more? A. No. Q. What do you bleach it for, then?

A. What do we bleach it for?

- Q. How much does it cost you to bleach; I will just change that question: How much does it cost you annually to bleach the flour?
- A. Well, let me see—oh, figuring roughly in my head, I would say fifty or sixty dollars a year for area that is consumed and the current that is used.

Q. What about pay for the machine?

A. How much do you pay?

Q. Yes. A. I paid two thousand dollars.

Q. How many horse-power of electricity have you equipped to make this gas with? A. Why—

Q. Not how much you use, but how much is your power,

your equipped power, your rated load?

A. I think that we did have; used in place of the regular Alsop generator, a motor; I think that motor is rated seven and a half horsepower.

. Q. What is the Alsop dynamo rated at?

A. I think that is rated 5 K. W., I am not sure.

Q. 5 Kilo Watt? A. 5 Kilo Watt.

Q. And each Kilo Watt is one equipped horse-power?

A. Each kilo watt is one equipped horse-power, that is about right.

Q. So to blow this summer zephyr into the flour you have equipped a seven horse power electrical plant, haven't you?

A. Yes, but we do not use this much.

Q. Of course not, but in case you should need it, you 1346 have seven horse-power to blow this summer zephyr into the flour; that is all it is for, isn't it? A. Yes.

Q. None of it is used to make something to put in the summer zephyr to put in the flour, is there?

I don't suppose so.

Now, is not the electricity used to make gas to put in the flour?

Well, it makes the arc, the arc makes—the arc is the dis-A.

charge in the air?

Yes, and that makes the gas? A. I suppose it does. And that is the gas that would smell in the flour bin? Q.

A.

You know that? Q.

You smell it in the flour bin, yes, sir. A.

- That is the gas that you smell in the flour then? Q.
- No. I never smelled it in the flour. A. Q. But you smell it in the flour bin?

I smell it in the flour bin. A.

But the only way it could get into the flour bin is to go Q. down through with the flour, isn't it? A. Yes, that is true.

Q. So, then, you know that this gas that you smell in the flour bin is made by the seven horse-power plant and is conducted into the flour and carried by the flour into the flour bin where you smell it, you know that, don't you? A. Yes, sir.

Q. Now, you know that is not air, don't you, pure air; you

know that don't you, Leflang?

A. Well, it is not pure air, but it has got something in it.

And you know that anybody that claims it is, is satisfied Q. about it, don't you, because you know it smells in the flour bin, don't you? A. Yes. 1347

Q. And it smells differently from pure air, doesn't it?

Yes. A.

And it smells like the nitrogen peroxide gas that has been exposed in this courtroom since the trial commenced, doesn't it? A. Yes, sir.

Q. And you would recognize it anywhere on earth, wouldn't

A. Well, I don't know whether I would or not. von?

Now, how many horse-power would you have to use bleaching your patent flour to naturally age it in ten seconds or fifteen or twenty, that would be the equivalent of three months' storage how many horse-power to make gas that would be the equivalent of three months' storage under proper conditions?

A. Let's see, I made some tests with the Watt meter to find out a few of these facts, we use-let's see-we use about ten, I think, to get that amount of aging it would take about ten

watts a minute.

Q. Yes.

That would be six hundred watts an hour; that is about three-fourths of a horse-power.

Q. How much would it take it to age it for two months?

A. Oh, I don't know.

- Q. I want the lapse of time against this gas, don't you see? A. Yes.
  - Q. A little bleaching is equivalent to a little aging?

A. Yes, sir.

- Q. Much bleaching is equivalent to much aging is your idea? A. Yes.
- Q. And much aging is equivalent to stronger smell in the flour bin, isn't it? A. I suppose so.
- Q. Much artificial aging. And too much artificial age is equivalent to sulphur colored flour, that is exposed to it, isn't it? A. I never seen any sulphur colored flour.
- 1348 Q. Mr. Leflang, do you take no steps to keep your agitator and conveyor free from this yellow flour that does accumulate in them? A. I never seen any accumulate.
  - Q. You never noticed that, you are not a miller? A. No.
     Q. You did not mill this flour? A. No, sir, I did not.
- Q. When was the flour that you substituted for this flour milled? A. I think it was the last of April.
  - Q. The last of April, a month later? A. Yes.Q. It has not been artificially aged? A. No.

Q. Nor bleached? A. No.

Q. Nor naturally aged? A. It is naturally aging.

Q. Yes, it is natural aging? A. Yes.

- Q. But it has not naturally aged when you sent it down to Terry, was it? A. No.
- Q. So it was very much inferior to what it would have been had it been naturally aged? A. That is as to color?

Q. Yes. A. Yes, sir.

Q. As to everything, isn't it, don't you know that flour improves if you leave it alone and don't poison it, by natural aging? A. It improves either way.

Q. It improves if you poison it?

A. I don't know that we poisoned it.

- 1349 Q. But don't you know that flour improves by natural aging? A. Why, yes.
  - Q. In bread making quality as well as color? A. Yes.
- Q. So that this flour that you sent to Terry was not naturally aged, was not artificially aged, and therefore very much inferior to what that same flour would have become had it been naturally aged, was it not?
- A. How is that, was very much inferior to what it would have become?
- Q. Yes, what that same flour would become by natural aging?
  - A. Yes, it was improved in color, and in baking qualities.
  - Q. The gluten would become more elastic?

A. Of course, that applies more in the fall of the year than at this time of the year, because the wheat is getting old and bakes out better.

Q. Now then that that flour that you sent out there of the sort [of sort] which we brought here, is inferior flour, compared with itself after natural aging, isn't it?

A. No, that is inferior only in respect to color.

Q. Doesn't it improve in quality when you naturally age it? A. Yes, both flours improve in quality.

Q. I am only speaking of one flour now. A.

Q. I am speaking of the flour that you marked "Purity" and sent down to take the place of your patent flour?

A. Yes.

Q. Now that flour when you sent it to Terry was inferior to what the same flour would have been had it been allowed to age for three months or such a matter? A. Yes, that is right.

Q. Greatly inferior, but if you had bleached it with your machine it would have looked as though it had 1350

been naturally aged, wouldn't it? A. Yes.

- The appearance would have been the same as though it had been naturally aged, and if in truth and in fact the natural aging does not improve the flour's quality beyond color, then you must say when you answer logically that the bleaching conceals the inferiority of freshness, must you not?
  - A. No. no.

Why? Q. Not inferiority of freshness, it is inferiority of color.

Well, we will just go over that once more. You say that natural aging improves color and quality?

Natural aging improves quality and color, yes, sir. A.

Color and quality you say. Now then this flour that you sent down to Terry, the substituted flour, was not naturally aged when you sent it, was it? A. It was not.

Q. It was therefore inferior, was it not, to what it would have become if it had been naturally aged? A. It was.

Bleaching of it would have made it look like natural aged flour, wouldn't it?

Yes, it would give it a better appearance. A.

It would make it look, that is an expert like you millers, might be able to slick down the two and tell which was which?

Yes.

But the natural wayfaring flour consumer could not, could he?

A. Well, they know when they get it home whether it gave them satisfaction or not.

Mr. Butler: I move to strike that out.

The Court: Yes, sir, that is no answer.

1351 Q. Answer my question; to the ordinary observer they would look the same?

A. They would look—well, if they compared them you mean one to the other?

Q. Yes.

A. No, they would notice the difference.
Q. Well, if they don't compare them?

A. If they don't compare them, they just bought one sack

of flour, when they would see no comparison.

Q. Now then if in truth and in fact Mr. Leflang, you are mistaken when you say that the quality of flour is improved by introducing this gas and air into it, then it follows, does it not that the bleaching conceals the inferiority and makes the inferior look like the better flour? A. No.

Q. You think that does not follow?

A. No, you can not bleach an inferiority of flour.

Q. What is that?

A. You could not bleach the inferiority of flour, that is all branny specks.

Q. You cannot bleach fresh flour? A. Yes.

Q. There are no branny specks in this "Purity" are there?

A. Well, there is always some.

Q. Well, I know, but we leave those out. Now I am speaking of fresh flour, and bread making quality? A. Yes.

Q. If you are in error when you say that bleaching by this gas improves bread making qualities, then it follows, does it not, that the bleaching makes the inferior flour look like the better flour?

A. Well, I don't know the way you mean the inferior flour, I don't understand the question.

1352 Q. Well, fresh flour, fresh flour is inferior you told me? A. No, not inferior, only as to color and age.

Q. And bread making qualities? A. Yes.

Q. So that the bleaching of fresh flour makes it look like the aged flour, doesn't it? A. Yes.

Q. And if it does not work precisely the same changes that natural aging does, it is a deception and conceals the true qual-

ity of the flour, doesn't it? A. That is true.

Q. So that in order to justify your conclusion, which was put in your mouth by Judge Scarritt, by a leading question, that it was naturally aged, it must be established that the nitrogen peroxide gas is the equivalent of time in the change which works upon the flour, mustn't it?

Judge Scarritt: I object to that as a mere argument, a stump speech to the jury.

The Court: You may answer yes or not.

A. Well, I think that is true.

- Q. Now you are not chemist enough to know, are you?

  A. Chemist enough to know, no, I am not a chemist.
- Q. You don't know about that. Did you know when you began bleaching flour that it added nitrites to the flour?

A. No.

Q. When did you find that out first?

- A. I think the first articles I read on that was possibly in 1907, there was several pamphlets published at that time, articles in our different milling journals if it was since then.
- Q. You now know and understand that it adds a material to the flour which upon being treated with this Griess-Ilosvay test gives the pink color that shows in the bread made from this flour? A. Yes, sir.

1353 Q. You know that, don't you? A. Yes.

Q. When did you find that out first?

A. When did I first find that out that this particular test would apply you mean?

Q. Yes?

- A. Oh I think I heard just a little about it last fall. Q. This past autumn? A. Yes, this past autumn, yes.
- Q. Did you understand that that was nitrite reacting material or nitrous acid, something of that kind? A. No.
- Q. You say there is a flash and a roar attending the making and breaking of the electric current as I caught your answer? A. I said there was a flash.

Q. I thought you said a roar? A. No, not a roar.

Q. Well, I was not sure, but then there was blue area, isn't that what you said?

A. A blue area around the outside of the arc.

Q. You were not present when this flour was milled, were you? A. No, sir.

Q. This patent flour that was seized? A. No.

Q. Were you at home that day or night or were you ont of the city?

A. I really couldn't say; I think I was at home.

Q. Now if three-fourths of one horse power will manufacture gas enough to be the equivalent to aging that three months, why do you suppose Mr. Tucker used 3½ horse power and two gas machines into one agitator to bleach this flour; did he want to make it as old as eternity itself?

A. No, if he made it as old as eternity it would be rancid.

Q. Yes, that is what I thought. A. Yes.

1354 Q. Over-treatment makes it rancid? Why do you suppose he used three and a half horse power on this flour?

A. Well, we didn't use three and a half horse power; there was three and a half amperes times 500 or 450, whatever our voltage is, I am not able to state exact on that; it would be less than three and a half to four horse power, three times five is two, will be about two horse power. Then we only use, when we are using two machines, three and a half amperes; we only use 20 watts a minute.

Q. I know what you generally do, you know what you generally do, but you don't know what was going on there

that night exactly? A. Well, I know.

Q. Because what he told you he used? A. Yes,

Q. And I suppose he told you the same thing if you asked him?

A. But two machines running on three and a half amperes is the same as one machine running on three and a half amperes.

Q. If one machine was enough why did you use two?

A. Because when he used two machines-

2. Make it old quicker?

A. No, it lightens the load on the two machines and prevents it from wearing out; the coils, heat as the current goes through them, that is what happened.

Q. So he needed so much gas to bleach this flour that if he had done it with one machine the coils would be heated and

worn out the machines?

A. No, practically all the mills use the same amount, that

is, three and a half to four amperes.

Q. I don't care what all the mills do, but then as I understand the reason for using the two machines to make the gas was because if you only use one that it would have worn that one out by heating the coils?

A. Well, that is an electrical condition that applies to all machinery that is running electrically, that if you pass a large amount of current through a small wire that it will heat up quickly, and that is the natural breaking

down of all electrical machinery—overheat it.

Q. Is natural aging in color in flour a defect?
 A. It is considered so by some.

Q. Do you consider it so?

A. I do in our Nebraska wheat.

Q. You consider natural color a defect. What is the natural color of a 50 [—] cent patent compared with a 90 [—] cent patent flour made from the same wheat?

A. Made from the same wheat?

Q. Yes,

A. In the same method, depend upon the milling.

Q. Yes, I know, but suppose you grind to get just the pure middlings 50 per cent, would you get a whiter flour than if you put in 90 per cent?

- A. Well, if you get a whiter flour it would be very little difference.
  - Q. It would be a little whiter, wouldn't it?
     A. Oh, not much, I don't believe it would.
- Q. No, 100 per cent patent is as white as 50 per cent patent, is it? A. Oh, not the extremes.

Q. What? A. Not to extremes, no.

Q. What do you mean by not to extremes?

A. Well, I mean this, if you take 100 per cent there might be some 100 per cent patents that would not have the color of the 50 per cent patents.

Q. I mean from the same wheat?

A. From the same wheat, yes, from the same wheat too.
Q. 100 per cent as white as a 50 per cent patent?
1356 A. No, it is not exactly as white but the color is very

close.
It is not as white then? A. It is very, very close.

Q. It is not as white then? Q. Very close? A. Yes.

Q. So then if you bleach the 100 per cent patent a little, just a little, a few breaths of zephyr, it would make it look like the 50 per cent patent, wouldn't it? A. Well.

Q. Under that influence, wouldn't it?

A. It would in color the same appearance, yes.

Q. I mean in color, of course.

A. I don't think it would make the same loaf of bread.

- Q. So that the situation is this, if a longer patent is a little more yellow or not quite so white in color, then the shorter patent a few breaths of the modified air will make it look like a shorter patent, won't it?
  - A. I think it would make it whiter than the shorter patent.
  - Q. Yes, you can make it whiter than the shorter patent?

A. Yes.

- Q. And so if you take the clear free from bran and these impurities that the morality of this machine will not permit it to bleach and bleach it a little and mix it with your patent, then it would all be a little whiter than the natural patent, wouldn't it?
- A. Well, if it didn't have any specks in it it would be first class flour, it would be a high grade flour, it would not be called clears.
- Q. And it would be a little whiter than the natural patent wouldn't it?

A. Well, it would not be called the clears if it didn't have these inferiorities in specks.

Q. You have told us a miller can call these things what he pleases?

A. Yes, sir; but you are speaking about what we generally term a clear patent that has specks in it.

1357 Q. Now so that if you take a flour made from the yellow berry it will be naturally not quite so white as from the same wheat that is not the yellow berry, is that right?

A. Well, I think they would be about the same color; we have there—we raise in Nebraska hardly no wheat that grades turkey.

Q. I know.

A. No, our natural wheat in Nebraska is No. 2 hard.

Q. Will you answer my question, and it is this: Does the yellow berry wheat make as white flour as the same kind of turkey wheat which is not yellow?

A. Well, do you mean Kansas wheat, Kansas turkey wheat.

Q. I don't care.

A. Well, you take Kansas turkey hard wheat, I believe makes as white a flour or whiter than any other hard wheat flour but the turkey flour, the pure turkey wheat is a very small amount.

Q. I am not speaking as to the amounts now.

A. You want to get the averages?

Q. No, I don't want to get the averages, I want to get a bucketful of yellow berry and the kind Tucker says was in your wheat? A. That is—

Q. And I want to ask you whether that will make—mill into as white flour as the wheat of the same type which is not yellow?

A. The same type will, if you use the same type raised in our State in our locality, I think that our darker wheats and our lighter wheats will make practically the same flour, the same appearance.

Q. So that you hold, then, that the yellow berry makes as white wheat as the Turkey hard of Nebraska, that is, white

flour? A. We don't raise any in Nebraska.

Q. I am not asking what you raise in Nebraska; I am asking you if you—

A. No, you are asking if we raise Turkey hard in Kansas.

Q. I am not asking if they are raising Turkey hard in Kansas; I am asking you if the yellow berry that Tucker says was in this flour that we seized,— A. Yes.

1358 Q. Will make a white flour as the rest of the wheat that was in that same flour, that is what I am asking you, no matter what is raised now.

A. Well, I think it will; I never tried them separate be-

cause it is the natural condition they had to be mixed.

Q. Yes, all right; so, then, it is your opinion and your statement to this jury that vellow berry makes as white flour as if it does not become yellow?

A. Well, yes, that is true in general cases; now, the yellow berry wheat that is raised in some parts of the state, the

two a hard wheat would make a different color flour from wheat raised in other parts of the state; I have seen it vary a great deal even in the same locality.

Q. Where did you get this wheat that made this flour?

A. Well, it was raised in our county, all of it, as near as I can recollect.

Q. Your scale books show then from whom you got it, how you graded it and what you paid for it?

A. Well, I could not, that particular wheat.

Q. No, but it shows what came in during the time that that wheat came in? A. Yes, yes, it does.

Q. That scale book is in your control, isn't it?

A. It is not just now; no, it is at home.

Q. Well, I mean as the manager of this mill? A. Yes, sir.

Judge Scarritt: Do you want it, Mr. Butler?

Mr. Butler: It would probably show quite as much as these little things in the bottles.

Q. Now, do you say that this Purity flour was the same kind, that you sent to Terry, was the same kind of flour as the flour seized, except one was bleached and the other was not?

1359 A. Well, as near as I know we used about the same kind of wheat, it varies from day to day, there is always a slight fluctuation; I notice that in years in the milling business, the business from day to day, it is changing in appearance.

Q. Is it within your knowledge that the longer the patent the higher the ash content, other things being equal?

A. I never-

Q. You don't know?

A. I made no study of the ash content, never heard of it.

Q. So then you couldn't tell us how it come that the content of the flour shows upon examination a very much higher ash than the flour substituted for it?

A. No, not according to the ash; I know one reason why that may possibly be true, that it does show a difference, because we recorrugated the rolls in between the two shipments.

Q. You think recorrugating the rolls would put more ash

in it? A. No, it would put less ash.

Q. You think that the condition of the rolls takes out the ash, do you? A. I think so.

Q. How is that?

A. To some extent it makes a little more flour. Q. Was that to get ninety per cent too? A. Yes.

Q. How long have you used bags branded just as the bags were in this flour seized?

A. How long have we used the sacks?

Q. Yes.

A. With the one change we have taken out the word, when that sack was originally designed we had "Hard Spring Wheat", and when we changed over to "hard winter wheat" we eliminated the word "spring" we have been using the hard winter wheat.

Q. Does the quality of wheat which your mill handled depend upon seasons and vary from season to season?

1360 A. Yes.

Q. Do you have No. 3 wheat sometimes, some years?

A. We have, some years we have No. 3 wheat, yes.

Q. Some years probably No. 3 wheat, probably 4, sometimes some unfortunate farmer lets his wheat sprout in the shock, or something? A. We don't use that.

Q. You don't buy that?

A. We buy it; we do not use it.
Q. You just keep it? A. Ship it.

Q. And you never in your life used No. 3 wheat to make flour to put into the sacks from the first quality hard wheat?

A. We may have used 57 or 56 pound wheat that was light that was dirty, but when it is cleaned up it would make good wheat, in fact some of the best wheat I have ever seen in Nebraska weighed only 55 or 56 pounds.

2. So then the first quality might be bought as rejected or

No. 4 or No. 3? A. No, not as rejected.

Q. But as No. 3? A. It might be No. 3 wheat. Q. Might be No. 4? A. No, it could not.

Q. So that it would sell as first quality when even though

you paid the farmer for it on a lower basis?

A. Well, that depends upon the—you see wheat that only weighs 56 pounds would not have as many pounds of flour to the bushel, that is the reason why there is a difference in the price of wheat.

2. If there is a good deal of foreign stuff do you dock

them a little for dirt?

A. We do if there is a large percentage of it, yes.

Q. And if 59 pounds is the weight of the wheat though, you take the dirt? A. No, that is the best wheat.

1361 Q. So that you buy that on the basis that you grade it on the best wheat then to the farmer, do you?

A. On the best wheat, yes, to a certain extent, we do.

Q. And then you dock him for the dirt?

A. Not in 59 pound wheat,

Q. And if it is 54 pound wheat or 56 pound wheat after you get it and put it through your process, then it is the first quality of wheat?

A. No, not always, that would not follow.

Q. Isn't it true when you put in the sacks the flour from

the No. 3 wheat that it was not first quality wheat?

A. Well, that No. 3 wheat, the only trouble is that it had dirt in it when it came in, that is chaff and straws of wheat or kernels that were slightly shrunken; that would still be good wheat when it is cleaned up.

Q. Well, we will drop that. You say that the patent flour

is anything that the miller has a mind to call patent?

A. Yes, that is within certain limits.

Q. Well, depending upon the miller's conscience, or what?

A. No, not upon the conscience; he would have to make a flour, he could not mark a flour patent hardly, that is, in our section of the country, and sell it as patent flour, that is his first grade flour in competition with the other mills if he did not make good flour now, of course.

Q. And patent flour means good flour?

A. Well, yes, that has been my general understanding of it.

Q. And then good flour is what the miller thinks is good

flour?

A. Yes, what the customer thinks, because he sends it to the customer with a guarantee, and if it does not give satisfaction, why, he is the loser.

Q. So that you say in the flour market of the country pat-

ent has no meaning?

A. It has a meaning, and still it has no definite meaning.

1362 Q. No, it has no definite meaning?

A. Has no definite meaning.

Q. But it does mean that there was a clear flour taken out, doesn't it? A. Yes, sir.

Q. And it does mean that it is from middlings, don't it?

A. No, sir.

Q. Patent flour means that it includes the middlings, doesn't it?

A. It means that it includes the middlings, but it may include the other flour too.

Q. It may include something else too, you think?

A. Yes, sir.

Q. And it also means that there has been taken out some flour other than middlings near the outer coats of the wheat, that is, an eatable flour, quality of flour?

A. Quality of flour, but inferior on account of the specks

that are in it, due to improper milling.

Q. So that in every case you say that the patent includes

the middlings? A. Yes.

Q. So that if a man sold flour that did not include the middlings and branded it "Patent", you say he would be misbranding it, wouldn't you? A. Yes, I think he would. Q. So that if he took out ten per cent middlings, ten or twenty-five per cent, the very high patent, and sold it to make beaten biscuits of, which is much consumed in this neighborhood, I understand, and further south, and then sold all the rest as a patent, that rest would be misbranded because it did not contain all the middlings, wouldn't it?

A. I don't know as that would be the fact there because I never seen those flours, I never seen anything like that, we

don't have that class of trade.

Q. No, you don't make that kind, but you told Judge 1363 Scarritt that patent didn't have any meaning in this country except what the miller wanted to call it?

. That is except as applies to the different individual

mills in the different sections of the country.

- Q. Yes, but you know that when you see the word "patent" on a sack of flour in the flour market that that means that that flour includes the middlings, that is what that represents, doesn't it?
- A. I don't know as I would always understand that to be the case.

Q. You would think it would be misbranded?

- A. I don't know as I would call it misbranded because there has been no standard fixed.
- Q. So then, now, do you want to say now that it is just what the miller wishes to call it?
- A. Yes, what the miller wishes to call it and the standards established in the locality in which they are trading.
- Q. Yes, but the standards established everywhere is that the patent includes the middlings, doesn't it?

A. Well, I don't know as that has been settled.

Q. Is there any standard by users that the patent may be labeled a patent without falsehood?

A. I don't know, I know it has been done, at least I have

heard it said.

Q. You think that is misbranding, don't you?

A. Well, I think it would be. Q. You think it would be?

- A. Might not be because it has not been established one way or the other.
- Q. Now, with respect if flour is made of all yellow berry and it is called first quality wheat, is it misbranded?

A. It is not.

Q. If it is made of No. 4 and labeled first quality is it misbranded?

Judge Scarritt: I object to that as asking for the con-1364 clusion of the witness.

The Court: I sustain the objection.

Q. Did you put galvanized pipes in your plant when you first began? A. We did.

Q. Why?

Why, I don't know just why we did, we put them in, that is why I know.

Q. Did Alsop install the plant? A. No, we installed it.

Q. You installed it? A. Yes.

Q. Do you observe on this Exhibit 25 that the threads at the end of the cap on the inside are rusted badly, practically destroyed? A. They are not rusty, not destroyed.

Q. It is not rusty?

A. Well, it is rusty but it is not destroyed, they are still there, are they not?

The Court: Let the jury see it.

Mr. Butler: I will do that in a minute.

A. Are they not there?

Q. Now, what is it, in your opinion, that made that rust, if you call it rust, so fast inside and none outside, but it was

air passing through it or the gas corrugating it?

- There is moisture in the arc as it goes through the air and warms it up, I think that there is more corrugation at any time in the winter than when it is hot, when it goes through the flame it is hot.
  - Did you ever taste that moisture? A. Never tasted it.
- Q. Don't you know it is nitric acid? A. I do not. 1365 Q. Don't know that. Ever see nitric acid on iron? Yes, I think I have but I couldn't tell you now. A.

Q. Did you ever smell it?

I never smelled nitric acid on iron; I have smelled it, but I don't remember the smell, I would not [-] able to say now, it has been so many years ago.

Q. Well, now, moisture is not so bad on rubber, is it, as it

is on iron?

There is more heat, that is right close to the electrifier, and the air is very hot right there.

Q. Was there an iron pipe running through this?

No. sir. A.

Q. The gas passes through this? A. The gas passes through there.

Q. And when was it last in use? A. About ten years ago.

Q. Taken off for the purpose of an exhibit here?

Yes, sir. A.

Q. Did you brush it out on the inside? A. I did not.

When you took your pipes apart every year to clean out the rust did you clean out this one too?

Why, I don't know whether they have or not; I have not noticed the mills.

Q. Just put your finger on the inside of that and see if it is rusted in there, put it clear in so you get in far enough. How do you suppose that came on there—rust?

A. That is not rust.

Q. You think nitric acid did that?

A. What do I think that is?

Q. Yes.

A. Why, I think that is more of a combustion from the arc.

2. You think that is burned?

A. Yes, kind of a dust that goes through.

- 1366 Q. So that is the reason, because it was hot enough to burn rubber right at the agitator, that is the reason you put rubber there, was it?
- A. Yes, sir,—no, that is put there for electrical purposes to insulate the pipe that goes through the mill from the machine itself in case of an electrical breakdown in the agitator or in the electrifier that the current woul not follow along the pipe.

Q. So that the electricity would not follow along and kill

the people in the mill?

- A. And kill somebody in the mill, because it is high voltage.
- Q. It is a high voltage and so high that you used that insulator to keep that current from spreading over the mill and killing people, didn't you?

A. We had the same if it was 100 volts.

- Q. I am not asking you that, but that is the reason, because you feared that that current would kill people?
- A. It is only natural to insulate all electrical machinery.

  Q. When did you make a loaf of bread out of bleached flour and compare it with one unbleached?

A. Oh, I think we done it last fall, probably, possibly the

last time that I have any special knowledge.

- Q. Did you compare it with the aged, unbleached flour or the fresh unbleached flour?
  - A. I think it was a fresh unbleached flour, yes.

Q. How did it come out?

A. Well, one was much whiter than the other, worked up a little better, in its appearance.

Q. About the same size in loaf, volume?

A. About the same size.

Q. The only effect that you noticed then was on the color?

A. Color, and a general coloring of the flour.

Q. Did you ever take some flour and save it for three or four months till it was aged naturally, then make a loaf of bread out of it, and out of the flour made from the identical wheat under

identical conditions make another out of the bleached

1367 and compare it? A. No, never done that.

Q. That would be a good way to compare artificial aging with natural aging, wouldn't it?

A. I suppose it would be.

Q. And to compare your so-called bleached flour or artificial aged flour with the same flour fresh is not a comparison at all except as to color, is it?

A. Well, it is a comparison as to color and the way that it works, that is, the handling of it, whether it is sticky or not.

Q. New flour is a little stickier than the same flour will become when it is aged naturally, isn't it? A. Yes, sir.

Q. Short dough is inferior dough, isn't it?

A. Well, I don't know about those, I don't know what you mean by a short dough.

Q. Inelastic dough is an inferior dough, is it not?

A. Inelastic?

Q. Yes. A. Well, I don't know. Q. You don't know about that?

A. I don't know anything about doughs, that is the-

Q. A dough that has no elasticity like a rubber band is an inferior dough, is it not, resiliency, Dr. Shepard called it, that is an inferior dough, is it not?

Q. Well, to a certain extent; I don't know much about this.

- Q. Now, if these witnesses who have testified here or know it to be the truth that the bleaching of flour by this process makes the dough short, destroys resiliency so that it injures it and damages it, doesn't it, or don't you know anything about that? A. No.
  - Q. So then did you ever see bleached flour that was bleached by the fumes of a sulphur candle?

1368 A. No,-with a sulphur candle?

Q. Just an ordinary disinfecting color?

A. No, I never have.

· Q. Are you familiar with the bleaching of wheat by sulphur fumes? A. I never heard of that; it is something new to me.

Q. You are not aware then of what the effect of bleaching of wheat by sulphur candle is, or bleaching the flour?

A. No, I only bleached oats more particularly.

Q. And you are not aware that the bleaching process that makes the dough short injures the flour, for instance, even with the fumes of a sulphur candle it would make the dough very inelastic with any resiliency; you think that would injure the flour? A. I don't know.

Q. You don't know about that?

A. I don't know anything about that.

Q. That will be all.

By a Juror:

- Q. How many pounds of this do you get out of a bushel of wheat? [Q.] Which one is that?
  - Q. All of them. A. All the cleaning?

Q. All you clean—about fifty-nine pounds?

A. Oh, we get screening, that is from 59 pound wheat, it will take out about two pounds, I would say, on an average.

Q. In the whole cleaning?

A. Yes, in the whole cleaning, two pounds is probably an inside figure; it might be a little more than that; it would be rather hard to state exactly.

## By Mr. Butler:

Q. At your mill do you make a straight flour? A. Yes.

Q. You brand it patent? A. No, sir.

Q. What is the brand, give us the whole story.

A. Well, we have branded it patent, but we don't any more, we have not for some time, we never done it as a matter of deception, however, not at all.

Q. Oh, no, but because you wished to call it a patent?

A. Well, yes, possibly; I have sent out flour when we exported, the exporters, branded that way.

Q. Never sold any to the American citizens, though, did you?

A. Yes.

#### By the Court:

Q. Sent it all to Europe.

#### By Mr. Butler:

Q. What per cent do you call straight?

A. Now, talking about per cent, we make what we always have called the 90 per cent patent and the 10 per cent clear; now, some others had low grades in as part of their patents.

Q. Now, I am rot asking about the others; they will all be

here, and we will ask them. A. Sure.

Q. Well, was that all?

A. I understand they talk about low grade flour being a flour stream, now, it may be possible that it could be termed a flour stream, but we have never termed it as such at our mill.

Q. Well, I am not informed what per cent you call a stream.

A. We ran the patents and clears together, the entire patent stream and your first grade stream into clears together to make our straight.

Q. And that is 100 per cent?

A. That is 100 per cent, of these two streams, if we count it the low grades as flour, why, then, it would only be 93, a

100 per cent patent.

Q. I understand, but 90 per cent flour from your mill is regarded as a patent, 10 per cent is clear and when the two are put together you call them a straight, but have sometimes labeled it "patent" and sold it to foreigners and also to Americans? A. We have.

Q. And bleached it? A. Yes, we bleached it.

Q. And this bleaching machine was dishonest enough to bleach that clear, was it?

A. Well, there is enough patents in there so that it does not

hurt it.

Q. So that, notwithstanding there are always these branny defects and foreign matter in the bleached, if you bleach it and mix the clear with the patent, then you have found it practicable to label it all patent and sell it as a patent, haven't

you?

A. No, I don't think that we have deceived the people, we sold the two grades together.

Q. You sold the two grades together; I said you have found it practicable?

A. You are asking if I deceived the people by selling the

flour that way?

Q. Then I misspoke myself; you have found it practicable by the use of this machine to bleach 100 per cent, all of your patent 90 per cent, all of your clear 10 per cent, label it as patent and sell it abroad and at home as such, haven't you?

A. We have sold the first grade and the second grade as such, yes, we sold our Cream XXXXX brand and Patent

XXXX together through the same merchant.

Q. Now, I am not making myself clear or you are misleading me in some inadvertent fashion. You say that you bleached your patent and you bleached your clear or bleached them when they are mixed, and that you have sold it as patent, am I right?

A. We have sold it as our second grade, yes.

## By the Court:

Q. Patent of yours?

A. Well, yes, the sacks have been marked so, a few of them, yes.

By Mr. Butler:

Q. As a matter of fact, you have found it practicable and have practiced it, to bleach 100 per cent of the commercial flour produced and put it in bags marked "patent" and sell it as such, haven't you?

A. Yes, yes, we have done that.

Q. Now, how long have you followed that practice?

A. Oh, we have been, I guess right along, no special change.

Q. Ever since you had the bleacher?

A. Yes, and we done it before.

Q. And did it before?

A. Had the same brand, we have had the same brand, why, we had one sack, I remember, from the second patent—

Q. No, I am not asking about the second patent.

A. Well, that is one of our brands that we have had 1371 for twenty-five years.

Q. How old are you?

A. I am thirty-two.

Since you were seven? A. Yes. Q.

And you know what was in those bags?

Well, I know that sack has been there at the mill all that time because it is one of our old brands.

Since you were seven?

A. I don't remember when, seeing it myself.

Are those sacks as rusty as the inside of that rubber hose? A. No.

#### Redirect Examination

By Judge Scarritt:

- Q. You stated in answer to one of Mr. Butler's questions that the bleaching did not increase the nutritive value of the flour: did it diminish the nutritive value of the flour?
  - No, I understand it does not, what I mean-What do you mean by nutritive value?
- Well, as I have seen it expressed heat units, that is A. the\_
  - That is what you are talking about, heat units? Q.

Yes, that is what I mean by that, I have no absolute A.

knowledge of that one way or the other.

Q. Now, he has asked you about the relative difference in the color and quality of the different grades of flour of wheat flour that was bleached. I will get you to state to the jury whether or not the same relative difference is found in the color and quality and strength of the flour after these different grades are bleached, as before?

A. Yes, the same difference is there between the-you mean between the first grade and clear, or between first grade and

clear, or between first grade and straight?

Q. I mean the first grade and second grade and any other grade?

Yes, the same difference would be there relatively as to A.

color and appearance

Q. That is, there would be just as much difference in the bleached flour after as there was in the unbleached

flour before it was bleached in the different grades?

A. Well, you take the bleached patent and clear flour, it would show really more difference, because the uniformity, the little bran specks would show up in the clear when it was bleached, and it would not show in the unbleached clears.

As you said before in your examination, as I understand you, that the defects are made more apparent by the bleaching if there were defects there? A. Yes, sir.

Q. Now, talking about this patent flour and about the amount of milling or amount of good flour that you would get out of the wheat. I will get you to state to the jury whether or not all the wheat in the kernel is good for bread making purposes and for commercial use, all the flour in the wheat?

A. Why, we don't get out of the wheat all the flour that we should get out of it right now because our milling pro-

cesses are not as perfect as they should be.

Q. Right there, now, what do you in your milling experience and in your observation and your reading, what amount of what you might call good flour, or what you generally term patent flour, do you get out of that wheat, twenty or twenty-five years ago?

A. Oh, we used to get-

Mr. Butler: I object to the twenty-five years ago as too long for a thirty-two year old boy.

Judge Scarritt: He knows what the history of this matter is, if Your Honor please.

The Court: He says he is thirty-two years old now, I don't know.

By Judge Scarritt:

Q. Well, as far back as you remember?

A. Well, when I started in the mill the first time we were making, one plant that was in there then we were making 75 or 80 per cent patent; we were making 75 or 80

1373 per cent patent.

Q. How much according to your knowledge of the milling processes were made before that time?

A. Well, there was-

Q. What is the last you know of?

A. A number of years ago all the good flour they got out of a bushel of wheat was 15 to 20 per cent which was sold as first grades.

Q. How did they get more as time progressed?

A. Why, more improved machinery, better machinery and better cleaning of the grain, refinement and separation of the flour, different machine.

Q. Well, as the machinery improved for the purpose of separating the flour in the grain you got more good flour out of

the grain?

A. Got more good flour out of the grain.
Q. And are you getting out all of it yet?

A. No, we are not.

Q. So that the improvement in the machinery is what has enabled you to get what you call a higher patent or a higher amount of middlings? A. Yes.

Q. A higher amount of good flour?A. A higher amount of good flour.

Q. That is all that middlings means, isn't it, a good flour?

A. Yes.

Q. Now, did you make any change, did you make any change, did you have the same patent flour before you put the bleacher in as you had since?

A. Yes, the same percentage.

Q. And the same percentage of flour out of the wheat?

A. Yes, sir.

Q. So that you have not changed your percentage of the flour that you get out of the wheat and call it patent or second patent, or whatever your second brand was, after you put in the bleachers, just the same as it was before?

A. The same percentage, we remodeled the mill three years ago and we are getting more flour out of a bushel 1374 of wheat, but the percentages are about the same.

Q. And it is as good or better flour?

A. It is better flour, we are making better flour now than we did ten years ago.

Q. Why? A. Because better machinery.

Q. And the better machinery, and some millers have got better machinery than you have got, haven't they?

A. Yes, I guess they have.

Mr. Butler: We are not trying that now.

## By Judge Scarritt:

Q. Anyhow about this yellow berry, or this red Turkey wheat that they have talked so much about, and the yellow berry, just explain to the jury, just take one grade of wheat, as far as that is concerned, is there both red Turkey and yellow berry in any one grain of wheat?

A. Well, that is rather hard to explain. Now the real Turkey wheat is only raised in one small district in Kansas. Q. Well, what they call Turkey wheat all over Kansas?

A. What we call—we have a wheat in Nebraska that has a dark color, it is dark red, and it is glassy when it is cut open, and makes a very good flour, and that is what the millers in speaking with each other call their Turkey wheat; it is probably a wheat that would hardly grade Turkey however, in a market like Kansas City; and then we have our other kernel, the yellow berry or the yellow belly kernels that are mixed with them; they grow from the same seed, and they change back and forth. I have read a great many bulletins and articles on that and no one seems to be able to explain the reason why those kernels change from one to the other without any apparent reason.

Q. Well, they are both in the same kernel, aren't they?

A. Yes, sir, sometimes you can cut a kernel open and one half of it will be that mealy wheat and the other part of it will be glassy.

Q. And sometimes you can take a kernel and find a yellow

spot on one side of it?

A. And be red on the other side.

1375 Q. And be red on the other side, and a small part will be yellow berry and the balance of it will be what you call Turkey red, or vice versa?

A. Yes, sir.

- Q. It is absolutely the same wheat and the same flour, isn't it?
- A. I have seen the two kinds of kernels growing on the same head of wheat.
- Q. And whenever a grain of wheat has got that yellow spot on it they call it yellow berry?

A. They call it yellow berry.

Q. Notwithstanding that nine-tenths of it may if it had not had that yellow spot on it, would work into the red turkey?

A. Yes, sir.

Q. Or some proportion of it? A. Yes.

Q. Now, this flour which was seized in this case and in this sack here was made out of middlings?

A. Is it made out of middlings?

Q. Yes.

A. It has all of our middlings streams in it.

Q. Then it is made out of middlings? A. Yes, sir.

Q. And it meets the definition that even Mr. Butler has about middlings.

# By the Court:

Q. Is there anything else?

A. Yes, there is some of the break streams in it.

# By Judge Scarritt:

Q. Well, it has got all the middlings in it?

A. It has got all the middlings in it, yes, sir.

Q. It has got all the middlings in it, and what you call the break streams are some other streams. Does that alter the quality of the flour? A. No.

Q. Or hurt it in the least? A. It improves it.

Q. How does it improve it?

A. Because we find by testing, that is one reason why we put those streams in, that we get more gluten in those streams than we do in some of our other streams that are more starchy

in appearance; I never washed them out and tested them myself.

Q. And some of the other parts of the stream which improves this flour, without giving any of the details?

A. Yes, sir.

1376 Q. It can go into it if he wants it. Now, he is speaking about the quality and value of the 100 per cent flour. I will ask you whether the bleaching process made any difference in that all, whether it was just the same before as after, this long argument you have had about the 100 per cent propo-

sition? A. I don't understand how you mean.

Q. Well, Mr. Butler was attempting to get you to say that there was in your flour the per cent that you put in this flour, and the per cent that you put in your second grade or your other flour, 100 per cent, one was marked XXXXX Patent and the other XXXX Patent. Now, as I understood you to say, you sold those both to the same trade? A. Yes, sir.

Q. Did you se! them as the same flour? A. No, we did not,

Q. Sold one as XXXXX and the other as XXXX?

A. Yes, sir.

Q. Why did you sell it as XXXXX?

A. Because it was a different grade of flour.

Q. They are a different grade of flour? A. Yes, sir.

Q. Now, did you do that before the bleaching?

A. We did.

Q. Did it make any difference about the bleaching?

A. No.

Q. As to who you sold it to or what you sold it for?

A. No, sir.

Q. You had the same brand and the same customers, the same trade before as you did afterwards? A. We did.

Q. Was it more satisfactory or less satisfactory after you commenced bleaching?

Counsel for libelant objected to the question.

The Court sustained the objection.

Judge Scarritt: I withdraw the question.

### Recross Examination

By Mr. Butler:

Q. Did you ever brand a sack containing flour made at your mill in any label to indicate that the flour was bleached?

A. No, no.

Q. Or artificially aged? A. No, sir.

Q. Or treated with nitrogen peroxide gas?

1377 A. No, there has never been any ruling to.

The Court: He asked if you ever branded it.

A. We have not done it.

Q. Never have done it. Is the bleached flour indicated on brands generally in the market, or do you know about that?

A. I don't know, that is, I would not-

Q. Did you ever see a bag of flour that was branded bleached flour by the Alsop process or any other process?

A. I believe they did do it in Kansas, but I never seen it.

Q. You never saw a sack in your life, did you?

A. I don't remember of any.

Q. How long was that rubber hose in use?

A. The rubber hose was in use a year and a half.
 Q. Did you have one there before it? A. Yes, sir.

Q. What became of that?

A. Well, that was thrown away when they moved, I suppose, on account of the changing of the length of connection to the pipe.

Q. It was not long enough? A. It was not long enough.

Q. How much pipe was thrown away?

A. Well, there was no pipe thrown away.

Q. Have you any of the pipe?

A. There was no pipe thrown away.

- Q. Have you any ungalvanized pipe that was used for six or eight months up there to conduct that gas anywhere, ungalvanized?
  - A. I think there is some nipples, that is a little short piece.

Q. How long have they been there?

A. Ever since the connection was made, a year and a half.

Q. Why didn't you bring them down so we could see the difference between galvanized and ungalvanized?

A. I can get some of them.

Q. I wish you would. A year and a half? A. Yes, sir.

Q. Did you ever brand clear and your first, second, third or also Fancy, patent?

A. No, I don't remember ever branding a clear a patent, in fact absolutely I don't believe we ever done it; we generally exported our clear, under a brand, I have no recollection of ever—

Q. What do you usually sell—you have a supply of these "Purity" bags on hand, called Fancy Patent, what do you usually put in them?

A. We put in the same grade as we put in the Cream XXXXX sack.

Q. The Cream XXXXX and the purity, the Cream XXXXX Fancy Patent and the Purity Patent is the same thing?

A. Yes, sir.

Q. Always has been? A. Always has been.

Q. Why do you have two names for it?

A. Well, we got that sack about two years ago, a salesman wanted us to use it for some of his trade in connection with some other mills that were using that same bag, the Purity, and we had them on hand, and we substituted this sack in place of the Cream XXXXX to avoid confusion with the trade, merchants, in this particular case.

Q. When did you use that?

A. When did we use it, what do you mean?Q. When did you begin to use the Purity?A. When did we begin to use the Purity sack?

Q. Yes. A. We used it for several years.

Q. Before you commenced to bleach?

A. No, no, we had not this sack.

Q. Did you use it before the ruling of the Department of Agriculture prohibited bleaching? A. Yes.

Q. Which was on the 1st of January, 1909?

A. Yes, we had the sack in 1908.

Q. Did you use that sack before the matter of bleaching

came before the Department of Agriculture?

- A. Well, now, I don't know when the matter first came before the Department of Agriculture; I know about when it went in there.
  - Q. Well, was it about the same time you got this brand?
- A. We started to use that sack in the spring of 1908 and used it regularly in the fall and winter.

Q. You put bleached flour in it? A. We did.

1379 Q. So the fact that you substituted this flour here, this unbleached flour, had nothing to do with your calling it "Purity", you don't call it unbleached Purity?

A. No, we did not, we have, I suppose, between twenty-five or thirty different brands, that is, special brands, and mill

brands, that the different merchants use.

Q. But none of them are branded bleached?
A. None of them branded bleached.

By Judge Scarritt:
Q. You brand to suit the merchant, do you, is that very often the case? A. Yes, sir, it is done.

Q. That is all.

John Wesener, called as a witness on the part of claimant, being duly sworn, testified as follows:

# Direct Examination

By Mr. Elliott:

Q. Doctor, please state your name, age, residence and occupation.

A. John A. Wesener; 45; Chicago, Illinois; consulting, analytical and research chemist.

Q. I will ask you to state your qualifications which entitle you to testify as an expert on flour, or otherwise, in this case.

A. Well, I took my course in chemistry, part of my course in chemistry at the Michigan Agricultural College and finished it at the University of Michigan in 1888. I took a course in medicine at the College of Physicians and Surgeons in Chicago and graduated in 1894. I held the chair of chemistry in the medical college of the University of Illinois, which was

formerly the College of Physicians and Surgeons of Chicago, for twelve years. I also was professor of chemistry in the Pharmacy School of Illinois for one year, and professor of chemistry in the American Dental School, which is now the dental department of the Northwestern University. I am president of the Columbus Laboratory, which is a laboratory located in the city of Chicago, and has been in existence since 1893. I have associated with me in this laboratory Dr. Adolph Gehrung, for eight years director of the municipal laboratories in the city of Chicago, and Dr. W. A. Evans, our present health commissioner in the city of Chicago. The Columbus laboratory was originally devoted to strictly medical work and received specimens from all over the United States from doctors for analysis and diagnosed, I think I probably have examined something like thirty thousand urines; I have pumped out probably about three thousand human stomachs, and have examined the contents of these stomachs. I have made examinations of all excretas, and a great many of the secretions of the human body. Since the last ten years we have gradually branched out in the Columbus laboratory and are now doing a great deal of food work and have been doing special work on flour analysis in the last ten years.

Q. Now, I want to ask you-

A. I have not finished yet, if you want me to go on. I have written a great many articles on strictly research medical chemistry which were published in this country, and others abroad, in Germany. I have made a special study of the examination of the gastric juice for the human stomach, and some of this work is considered by some of the authorities as classical in its line, at least I have proved that hydrochloric acid is the acid in the stomach and that it does not exist in the soil as a free acid, but that the hydrochloric acid is generated out of the soil by the spontaneous destruction of that soil when it is stimulated. I have written many articles on other subjects referring to digestion going on not only in the stomach but also in the intestines, and such work was done particularly on examination of the urine to see whether the fermentation in the smaller intestines was due to

the fermentation in the smaller intestines was due to acid fermentation, or whether it was due to putrefaction that is taking place. I have made quite a study

of flour and have examined flour for millers and bakers throughout the United States. We have a flour department and that is devoted to determining the commercial value of the flour; by commercial value I mean its baking value, its quality, its soundness, everything, because we are held responsible to the bar or the man that wants this opinion on the flour as to what that flour represents. I have written several articles with my associate Professor Tellar on the subject of bleached flour. I think the first one was away back in 1904, and some of these articles have been published, the last one in the Industrial Journal published by the American Chemical Society, that was in last October. We have written several others in addition to this and have made speeches relative to it before millers' organizations and also bakers' organizations on this subject. I am a member of the several chemical societies as well as of several medical societies, the American Medical Association; I am also a fellow of the Academy of Medicine and belong to the Industry Society of Chemistry, and so forth, and so forth.

Q. Now, I want to ask you specifically, have you been accustomed to making analyses of foods, grains of various kinds, including wheat and flour, and so on? A. I have.

Q. How long have you been engaged in such work?

A. Between ten and twelve years constantly.

Q. Examining flour and wheats and grains, and things of that kind? A. Yes, sir.

Q. Now, has your work been specialized along any particu-

lar line, and if so what?

A. Well, I have made a very careful study of wheat and flours, different kinds of wheat, and we have milled those wheats in our mill, we have a perfect little mill where we grind the wheat because we have to examine these wheat samples for the millers, as well as flour samples, and after we turn the wheat into flour we examine that flour in order to get an

idea of the grade of that flour and in that way to grade 1382 that wheat. I might say that we have made such analy-

ses for a great many of the experiment stations here in the United States like the experiment station of Iowa, Tennessee, Virginia, Michigan, for the experiment station of Canada, and we have also written a manuscript for the Secretary of Agriculture of the United States on the subject of Durham wheat.

Q. Now, then, your work in connection with flours involves examinations, and analyzing of samples of flours of various kinds? A. Yes, it does.

Q. And do you make many of such analyses in the course

of a year, and if so, roughly speaking, how many?

A. Several thousand yearly.

Q. To what extent, if any have you done work on cereals? Well, you answered it, involved that in one of your answers. Have you done any work with bleached flour, and if so, to what extent?

A. Well, I have made a thorough study with my associate Professor Tellar, beginning some time in 1903 on the subject, and continuing up to the present time, making a thorough study of the bleached flour.

Q. Are you familiar with the Alsop process and with flour

bleached by that process? A. I am.

Q. I don't know if this was included in your former answer, but I will ask you this specifically: How many samples of bleached flour would you estimate you have examined?

A. Oh, probably fifteen thousand, that is with my associates, as bleached flours came into the laboratory to be ex-

amined.

Q. Now, have you made any tests of bleached flour to ascertain if any damage of any kind was done to it, and if so state

fully what you have done.

A. Well, such analyses we make on flour, it is for the purpose of determining its value, why, our examination has to go into a pretty thorough work in order to determine whether or not any constituent in that flour has in any way been changed or damaged. We search carefully for the quality of the gluten, the color of the flour, the absorption of the flour,

the size loaf that the flour will make, the loaves of 1383 bread it will make; we go into the ash of the flour to

see about what amount of ash would be in the flour for the particular grade of flour. We go into the quality of the bread made from such flour, the fermentation period, and as I have already stated, I believe the quality, condition of the gluten.

Q. Now, was this work done in the regular line of your

business in ascertaining the commercial value of flours?

A. It was.

Q. Have you been accustomed during the past five or six years to receive samples of bleached and unbleached flours from millers and bakers for the purpose of comparing their strength, purity, baking qualities and other characteristics?

A. I have.

Q. And have you, as a matter of fact, made careful scien-

tific comparisons of such samples

A. We figure very careful scientific comparison, the best that we knew how to do, and of course will say that when we first examined the first bleached flour that came to our laboratory—

O. And when was that?

A. That was between the years 1903 and 1904, we proceeded with that analysis with a great deal of prejudice.

Mr. Butler: Just wait a moment. I move to strike out that answer as distinctly prejudicial.

The Court: Yes, that answer is improper.

Mr. Butler: And I move that the jury be told to disregard it as an improper answer.

The Court: Yes, the witnesses must recollect that they are not to argue the case, but answer the questions. It will be stricken out.

To which ruling of the court claimant then and there at the time duly excepted.

Q. And when did you first begin these investigations?

A. It was sometime in the year 1903 or 1904.

Q. Now, as a result from all of your work on commercial bleached flour and your study of the subject, I will ask you if you have found any constituent of flour either injured, changed or improved?

A. I have found no constituent in the flour injured. I

1384 have found no constituent in the flour improved, and
the only change I have found in the flour is the coloring
matter is gone as far as color appearance goes.

Q. Now, I want to take up first the question of gluten with respect to its strength, quality and elasticity. What do you find in those regards is the effect of bleaching, I mean?

A. I found that the gluten is not in any way changed from that gluten which is obtained from unbleached flour; they are identical in all particulars by a most careful and thorough examination.

Q. Now, as to the amount of gluten in flour bleached as compared with the amount in unbleached, the same flour unbleached is there any difference?

A. No, absolutely no difference, I don't think.

Q. Now, as to the odor of the flour as a result of bleaching what have you to say of that?

A. Find no odor in the bleached flour which is any different than the odor that is present in the unbleached flour.

Q. Now, as to the starch, any change?

A. Find no change in the starch.

Q. Now, generally, any other constituent of flour what have you found with respect to any change?

A. I find no change in the fat contained in the flour, and the only change that I have found is that the color has lost its yellow shade.

Q. Now, have you also made investigations to discover the effect of bleaching when the flour is made into bread, as to the effect on the baking qualities?

- There is no difference in the baking quality-
- Q. No, I just asked you if you had? A. Yes, I have made that, pardon me.
- Now, first I want to take up-I will ask you this gener-Q. al question-do you find any quality in the bread[impairs]in any way by the bleaching of flour?

A. I found no quality impaired in the bread by the bleach-

ing of flour as we receive flours at our laboratory.

I will ask you specifically as to the odor of bread made from bleached flour as compared with bread made from unbleached flour? 1385

I find absolutely no difference in the odor.

I will ask you in the same way as to the flavor?

There is no difference in the flavor; of course flavor depends somewhat on the way you handle the dough, and that can be changed, you know, in several ways, independent of anything else.

Q. I will take that up later. As to the color?

I find that the color in the bleached flour is whiter than that made from unbleached.

Q. Now, as to the loaf volume?

There is no difference in the loaf volume, one is as large A. as the other.

Q. Now, may we understand, am I correct on this understanding, that these views you have expressed, these opinions both as to flour and bread, are the result of several thousand experiments and determinations?

A. Of several thousand it has taken several years to make

these experiments.

Q. Now, I want to ask you specifically if, in your judgment, any damage of any kind is done to flour or to any constituent of it, or to bread made therefrom, by means of bleaching such

flour by this Alsop process?

I find no damage or any change produced in the flour by bleaching said flour, and in flours as we receive them at the Columbus Laboratories which we find to be commercial flours and are sold as such on the market.

Q. No, damage? A. No damage.

Of any kind. Now, to what extent, Doctor, have you found nitrite reacting nitrogen in bleached flours submitted

to you?

Well, this nitrite re-acting nitrogen, or this substance that gives this red color with the Griess re-agent, I find to be present on an average about one part in a million [figures] as nitrogen.

That is, as I understand it, in the thousands of samples which you have examined you have found the average amount

to be about one part per million figured as nitrogen?

A. One part per million would be a good, fair, high average it would be a good, honest average, yes, sir.

Q. Now, I will ask you if you have found such nitrite re-acting nitrogen in flour, that is naturally bleached?

A. I have.

Mr. Butler: Wait a moment. We object to that because no foundation has been laid.

Mr. Elliott: Well, strike that out.

Q. I will ask you if you have made any examination of flours that have been naturally bleached to ascertain if they contain any of this nitrite re-acting material?

A. I have.

At this point court took a recess until 2 o'clock P. M.

Court met pursuant to adjournment, at two o'clock P. M., Monday, June 20, 1910, and proceeded with the trial of said cause further as follows:

John A. Wesener, being recalled, was examined by Mr. Elliott, and testified further as follows:

Q. Doctor, there is one question I intended to ask you. What work if any, have you done in connection with the analysis of flour, in connection with state institutions, other

than experiment stations?

A. Well, we examine all the flours that are bought by the state of New York, for the Commission in Lunacy—that is, for all the state institutions of lunacy, and these flours are bought on the specifications which we have gotten up for that particular state, and the same is true for the State of Illinois, and also for the institutions in Cook County, Illinois.

Q. If I understand it, these flours are bought according to the standards that you set, or do you pass on the flour? They have to come up to the standards you

set? Is that it?

A. We make a specification, which we recognize as making an excellent bread flour, and the sample which is offered when the bid is made, we analyze, and then, they send us the delivery, and if the delivery comes up to the sample, that flour

is accepted at the price which was agreed on.

Q. Now, when we adjourned, I had asked you the question, of you had made any examination to determine if nitrite reacting material occurred in flour that was naturally aged and bleached, and you answered that you had. Now, I will ask you, have you found such nitrite reacting nitrogen in flour that is naturally bleached?

I have, to the same extent as that which has been rapidly bleached by the Alsop process, or through the oxide of

nitrogen process.

That is, flour which has never been near a bleacher, but, as they are exposed to the air, you have found, as I understand it, this nitrite reacting material in it,

A. I have.

How does the amount of nitrite reacting nitrogen in Q. naturally bleached flour compare with that in commercially bleached flour?

A. Well, it would have been present to the same extent, and even more than what we find in the commercially bleached

flour.

Mr. Butler: I move to strike out the answer as not responsive.

The Court: The answer is stricken out as not responsive.

By Mr. Elliott:

- Q. The question I asked, is, how does the amount of nitrite reacting nitrogen, in naturally bleached flour, compare with that in commercially bleached flour?
  - It compares with that, in commercially bleached flour.
  - Mr. Butler: I move to strike that answer out, as not responsive.
  - The Court: No, I don't think, myself, it is hardly 1388 responsive; but, if that is his answer, let it stand.
  - Q. I will ask you if you have testified that you have found, in these large numbers of samples of commercially bleached flour, an average amount of one part per million, calculated as nitrogen? A. I have.

Q. Now, how would the amounts that you found in naturally bleached flour compare with that amount? Would it

be less or more?

A. I have found, in a great many instances, much less, and

in some instances, more.

- Q. I will ask you, Doctor, you have used, I suppose, this Griess reagent on flour, have you-on commercially bleached flour? A. I have.
  - And flour that is naturally bleached, or aged? Q.

A.

Now, I will ask you, is it possible, by a chemical test, to determine if a flour has been naturally bleached, or bleached by this Alsop process,

It is not possible, by any chemical means, to determine whether flour has been naturally bleached, as by air, or by

the use of the Alsop process.

Q. That is, if I understand it, if you applied this test, and you got that reaction, you could not say whether it had been naturally bleached, or bleached by this Alsop process? Is that correct?

A. I could not.

Q. Is there any difference in the chemical reaction, between natural bleaching, and flour bleached by the Alsop process?

Mr. Butler: Objected to as calling for his conclusion.

The Court: He may answer.

A. I have never been able to find any chemical difference between naturally bleached, and that bleached by the Alsop process.

Q. Now, how have you arrived at this conclusion. Will you tell us, and, if you have made any experiments, you may

recite them.

A. Well, in this way: the coloring matter in flour is a distinct chemical body, and it reacts towards oxide of 1389 nitrogen in a certain way. That is, when it combines with these oxides of nitrogen, it loses its yellow color, and it does not make any difference whether the oxide of nitrogen is introduced by the flaming electric arc discharge, or whether the oxides of nitrogen be taken up from the air, by this coloring matter. Now, you take, for example, corn starch. That contains a—

Mr. Butler: (Interrupting) Just wait a minute. I object to that as argumentative, and not responsive to the question asked.

The Court: Yes, just confine your answer to the question.

Mr. Scarritt: He is going over the ground that his witness went over, if Your Honor please, and in the same way.

The Court: The objection is sustained.

Mr. Scarritt: Save an exception.

By Mr. Elliott:

Q. On this point, you stated there is no distinction between flour that is naturally aged, and flour containing nitric reacting material, and, flour that has been bleached by the Alsop process, containing nitrite reacting material. Now, I asked you on what you found that conclusion. Just explain to us your reasons for arriving at that conclusion. Have you made any experiments to demonstrate it, and if so what are they?

A. I have made experiments to demonstrate that. I have never examined a flour that had lost its color, but what I

have found nitrites, whether it was artificially or naturally aged. This coloring matter in flour is a base, just the same as sodium is, in starch, and it will combine with oxides of nitrogen, and when it combines with oxides of nitrogen, it loses its yellow color, but it would not make any difference whether it comes from the air, or whether it comes from an electrical machine, or from any other source. That is the natural chemistry.

Q. Now, have you, yourself, exposed flour that you found and determined was unbleached flour, that would not respond to this test—have you, yourself, exposed

such flour to the air, and if so, with what result?

A. I have taken unbleached flour, which contained this yellow coloring matter, and have exposed it to the air, and have noticed that the color disappeared. I will say that the unbleached flour showed no reaction for nitrite reacting material; that, after the color disappeared, I found the nitrite reacting material, and sometimes, after an exposure of—say a week or so, as high as four parts in a million of nitrite reacting material. That was naturally aged, or oxidized, as we say, and the nitrites were introduced in that way.

Q. Now, let me understand that. You have taken flour that you found to be unbleached, and not respond to this test for nitrite reacting material, you have exposed that, yourself, to the air, and, after a certain length of time, you have found, as I understand it, as much as four parts per million

of nitrite reacting material in it. Is that correct?

A. That is correct, sir.

Q. Have you found any distinct change in flour, where the same was naturally bleached?

A. Just repeat that question.

Q. Have you found any distinct change in flour, where

the same is naturally bleached?

A. Well, the only change that I found in flour that is naturally bleached, is, the loss in color, and a certain amount of moisture.

Q. What could you say about the gluten?

A. The gluten is not in any way changed, except that a certain amount of water is taken out of that flour, which, naturally, will toughen and strengthen the gluten, but that is no chemical change in the gluten.

Q. To what extent, then, are you able to explain the change

in flour, by natural aging?

A. Well, there are only two factors that we have been able positively to determine, in natural aging. First, that the color is removed.

1391 Q. Now, that is a result, is it. We find the color removed?

A. Yes, that is a result of this natural aging, due to the oxides of nitrogen in the air. Second, that there is a slight loss of water, in that flour. Outside of that, we have not been able to determine any other change that takes place in the flour.

2. Now, how does that statement apply to flour that is

bleached by this Alsop process?

A. Well, those same changes take place, only more rapidly, when flour is subjected to the gases produced by the Alsop process, namely, the color is changed from a yellow to a whitish coat, by the aeration, going from this agitator, and a certain amount of moisture eliminated.

Q. Well, let us get that clear, as to natural aging. You say you find the flour lighter in color, as I understand it, the only thing that you can explain as having taken place is, a

loss of moisture? A. Yes, sir.

Q. And when you take a flour that is artificially bleached, or bleached by this Alsop process, you find the color is lighter—

Mr. Butler: (Interrupting) Just wait a moment. I do think that I will be constrained to object to this witness being led by argumentative questions on the part of counsel. I hope it will not be necessary to repeat the objection.

The Court: Well, I think myself that the witness ought not to be led so much.

Mr. Elliott: I thought he had testified to that.

Mr. Butler: Well, then, if he has testified to it, it is not necessary for him to do it again.

Mr. Elliott: You did not spend hours at the same thing, at all.

Mr. Scarritt: I would suggest, if Your Honor please, that Mr. Butler did the same thing all the time.

The Court: You should have objected.

Mr. Scarritt: We did object.

1392 The Court: Very well. You are criticising me, and I have changed my mind, but, without having any wrangling about this, this question is exceedingly objectionable on the ground it is leading. Now, I do not care to be reminded that I did something on some other occasion. I may have been wrong about it, and counsel may not have objected. I say this, because, now, this is about twenty times that I have been reminded that, as a matter of trade, I ought not to do now what it is said I did the other day. This witness does not need any leading, and ought not to be led. Now, let us get along.

Mr. Scarritt: Now, let me make this suggestion, Your Honor.

The Court: Yes.

Mr. Scarritt: This is our expert witness, and I thought Your Honor probably suggested at the time that Mr. Butler was going over these same things—

The Court (interrupting): Now, there you go again. Now, I was wrong the other day, and you are right, always.

Mr. Scarritt: No, I beg your pardon.

The Court: Now, that brings it down to a matter of egotism. I admit I am wrong.

Mr. Scarritt: No, I am not making that objection.

The Court: All right.

Mr. Scarritt: I am just suggesting, we can get at it quicker, by simply summing up these things, and ask him if that is what he means, so the jury will understand, rather than going through a long category, and leaving us all in confusion as to what we are trying to get at.

Mr. Elliott: I thought we always did that, with expert witnesses, when they testified to facts, in order to get their opinion clear.

The Court: I don't know what you do in St. Louis. We do not do that out here.

Mr. Elliott: I withdraw the question.

The Court: All right. Do not lead the witness. Let us get along.

By Mr. Elliott:

Q. I will ask you this. What will be your opinion as to the comparative results produced in flour, by bleaching it with the Alsop process, and bleaching it, or aging it, naturally?

A. Well, there would be no difference. I found no difference in the examinations we have made. Of course, if you allow a flour to age too long, of course it spoils and becomes rancid.

Q. Well, keep both within commercial limits.

A. Keep both within commercial limits, there is no difference whatsoever.

Q. Have you examined flour bleached by the Alsop process, and flour bleached naturally, to find out if they contained nitrite reacting nitrogen, and if so with what results?

I have, and I find that the results are identical.

The Court: He has said he found no difference, two or three times. Now, let us get along.

By Mr. Elliott:

Q. To what extent are nitrites, and oxides of nitrogen

distributed throughout the world?

A. Nitrites, and oxides of nitrogen are found very widely distributed throughout the world. They are found in the air. They are found on a bright sunny day. They predominate, I should say, on a bright, sunny day, more than on a humid or rainy day. Rain will wash these products out of the air. They are constantly present in the air, whether fallen after a thunder storm, or in a clear, bright day, as for example, this day. They are found in certain beds, like, down in Chili, where we get

the Chili saltpetre. They are found in some fertilized soil, to the extent of one and one-half parts nitrite reacting nitrogen, in a million. They are found in food stuffs, found in the animal kingdom, such as the saliva, and, some authors claim they are found in every part of the human

body.

Mr. Butler: I have to strike out that part of his answer, beginning with the words "some authors".

The Witness: Well, I might add this-

Mr. Butler (interrupting): Well, just wait a moment. The objections are addressed to the court, Dr. Wesener.

The Court: Now, let me suggest. Now, of course, I don't want to limit anything, but the greater part of this has been gone over by witnesses on the other side. Now, let me ask, what is the use of taking up time, unless, now, you are going to contradict, impeach or rebut that which has gone before? In other words, why take up ham, bacon, and the air, on certain days, and all these things? I am asking you this, to see if we cannot save time. Now, unless you want to go farther,unless the witness knows of nitrites in something that the witnesses of the government did not know anything about, what is the use of duplicating it? If you say, for instance, that this witness is going to find nitrites in those things that the witnesses for the government did not find,-for instance, saliva, from childhood to old age,-that has been gone over, over and over and over. And, in smoked bacon, and smoked ham, and so on. Now, I am simply asking if you are going to go further than that.

Mr. Scarritt: They limited it, if Your Honor please.

The Court: I have just distinctly said, Judge Scarritt, if this witness wants to go further, than the others, there will be no objection. 1395 Mr. Scarritt: We want to go further, and find more.

The Court: All right. You go on, and find where this witness-

Mr. Scarritt: (interrupting) That is, more than that, anywhere.

The Court: Now, just a minute, I would rather state my own case, always,—not that I can do it so well. Now, I have always reserved that right. That is not my statement. My statement is, if this witness says nitrites abound, and can be found in those things that the witnesses for the government did not find them in, then, I say go on, and show them, but why take up the saliva? Why take up ham? Why take up bacon? And why take up the condition of the atmosphere? Now, if this witness is going further, and say he has found them where the witnesses for the government have not found them, there is no objection.

Mr. Elliott: If your Honor please, it is not so much that, because I imagine it is suggested—

The Court: (Interrupting) It is not suggested. It has been testified to twenty times.

Mr. Elliott: I just simply put that question as a preliminary matter.

The Court: I was just trying to save time, but I suppose we are losing more time, now. But, it does not do, in my judgment, to take up all of those things and go over them, over and over and over. Of course, I know, it is hard to get scientists to keep within range, in their testimony. I know that, but, go on.

By Mr. Elliott:

Q. In view, Doctor, of the wide distribution of these nitrites throughout nature, as you have testified, what could be your opinion as to whether they are necessary to life?

1396 A. They are absolutely necessary to life; that is, this change that brings about the formation of nitrites, are absolutely necessary to life. Without it, life would become extinct, both animal and vegetable life.

Q. To what extent does this nitrite reacting substance re-

main in bread made from bleached flour?

A. Well, that depends, simply, on the way you make bread, and simply on the kind of yeast you use,—that is, whether you use a special kind of yeast, or whether you use the yeast, the way that they make their salt rising bread, at home. That is,

set the sponge at night, and, how you work the bread, how long you allow this fermentation to go on before you turn the dough into bread. I have found, and we usually find in the laboratory, that, in most instances there are no nitrites left in the bread, but, that there is always a reduction from eighty to ninety-seven per cent of the nitrite material in the bread.

By Mr. Butler:

Q. What was the last statement?

A. Eighty to ninety-seven, I think I said.

Mr. Scarritt: I did not understand that. Was that in the flour, do you mean?

Mr. Elliott: As I understood the witness, the reduction of the nitrites in the flour, as you find them in the bread, is always from eighty to ninety per cent, sometimes over.

Mr. Butler: I do not think the answer shows that.

(Last answer of the witness read by the reporter.)

By Mr. Elliott:

Q. I will ask you this: have you made any investigation to determine if nitrites are in bread, made from unbleached flour? A. I have.

1397 Q. And to what extent does this nitrite reacting substance remain in bread made from unbleached flour?

A. To the same extent, if the bread is treated in the same way, from the unbleached flour, as in the bleached flour, and the same extent. It all depends, of course, upon the amount of nitrites that you start with, and the kind of dough you are making, and the kind of yeast you are using.

Q. Now, let us take, in the process of bread manufacture, before the dough is ready for the oven. What do you say as to the presence or absence of nitrite reacting material in that

dough?

A. Well, at that stage, if the fermentation has been of a long period, or if the certain kind of yeast has been used, that feed on nitrites, there might be no nitrites in the dough, at one time, when it is ready for the oven. If, on the other hand, that is the kind of yeast that does not feed quite so readily on the nitrites, or if the fermentation has been of a shorter period, why, there might then be some trace of nitrites left, but, as I have already stated, that is compared with what you found in the flour, there is always a reduction, even in those cases, from eighty to ninety-seven per cent.

Q. You used the words "long fermentation". I do not know just what is meant by that, but I will ask you this. Take a loaf of bread, or dough, rather, that would be made by the housewife, and allowed to remain over night, what can you say

then as to the disappearance of nitrites, and assuming that

veast had been used?

Well, in that case, the probabilities are that all of the nitrites would be consumed by the yeast, because that is a long fermentation.

Have you, yourself, made analyses of doughs thus made,

to ascertain that they contained nitrites? A. I have.

Then, your statement that the nitrites may disappear from the dough before it goes into the oven, is based on actual Is that correct? experimentation.

A. It is, yes, sir. 1398

I will ask you if bacteria and the yeast plant feed on these nitrites.

As far as I have been able to determine, certain bacteria and yeast feed upon these nitrites, and such nitrites are excellent food for such bacteria.

Now, what difference is there, if any, Doctor, between bread that is made from unbleached flour, and bread that is

made from bleached flour?

A. Why, the only difference that I have been able to determine is, that bread made from bleached flour is whiter, it is a better color, more even throughout the crumb of the bread, and, bread made from unbleached flour has color-yellowish, creamy, and this color may be in streaks, and part of it may be bleached out by the process of making bread, so that bread made from an unbleached flour may not be uniform throughout the cut of the loaf.

What would you say as to the loaf volume? There is no difference in the loaf volume.

Mr. Butler: That has been gone over very fully, this morning. Mr. Elliott.

Mr. Elliott: Well, I don't want to repeat. I do not remember, always.

Q. To what extent, if any, does the flavor of bread depend on the flour, or the kind of wheat, or the manipulation of the dough, or the mixtures put into it, in the bake shop-how would that affect, if at all, the flavor of the bread?

That would make a great difference in the flavor of the bread, the kind of flour you used, whether it is flour from a

soft, winter wheat-

(Interrupting) I think I will object to this Mr. Butler: as immaterial. It does not seem to consider the fact of bleaching, at all.

The Court: Well, he may go on.

A. (Continuing) Or, whether the flour is made from Number 1 Northern wheat, or hard winter wheat. Then, there is a big difference between the taste of bread made from what is commonly called clear flour, when compared with the so-called patent, from the same wheat, or the straight. There is very little difference in the bread made from the so-called patent, or so-called straight. They are the same wheat, providing the bread has been manipulated, and the ingredients that go into that bread are all the same. Of course, you must remember that, if you add lard, add milk, and other ingredients to the flour in the process of making bread, all of these ingredients that you add to such a mixture, add to the flavor and taste of the bread.

Q. Now, have you made any experiments to determine whether bleached flour has in any way been affected in digestive

value, and if so, with what results?

A. I have made some very careful and exhaustive tests on that, and have never found, in these, in any one instance, where the digestive value of the bread made from bleached flour has in any way been changed, injured, or differs from that from the unbleached flour—bread made from unbleached flour.

Q. I will ask you, have you made these digestive experiments with the flour as a whole, or with separate constituents

of the flour, such as the starch, and gluten?

A. I have made them from the flour, as a whole, and also separate constituents of the flour,—the starch, and the gluten.

Q. I will ask you if you have subjected these different constituents, and flour, itself, to the different digestive fluids.

A. I have, and the only difference that I have ever been able to find, is, when a flour was ruined by those gases, I find that the gluten digests quicker; and, that is perfectly natural, because mineral acids are the first stage of digestion in the human body.

Q. Doctor, I want to get your statement as to the meaning of these terms "patent", "straight", and

"clear", as applied to flour.

A. Well, I have been trying for a long time to give a definition of the word "patent". I cannot do it. I do not believe anybody can give a definition for the word "patent".

Mr. Butler: Well, it is admitted that, if you cannot, you think nobody can.

Mr. Scarritt: We move that that remark be stricken out as impertinent,

The Court: Go on, gentlemen.

A. (Continuing) The word "patent" originated, of course, when the roller milling process came in. That is, this roller system.

Mr. Butler: Now, we object to any historical narrative. He says he cannot define the word, and he thinks nobody can. Now, what is the use of going over thirty years of milling? That is, as far as patent is concerned.

Mr. Elliott.: Well, I have asked him to explain.

Mr. Butler: No, you have asked him to define "Patent", and he says it cannot be defined.

Mr. Elliott: I did not ask him to define it. I asked him to explain.

The Court: Well, he says it cannot be done, but he is willing to try. Go on.

A. (Continuing) The word "patent" came in with the new process of the roller milling. Before that time, the Burr stones were used, and the flour, at that time, as I remember, was not called patent, but, when this roller system came in, all flour made by the roller system was called "patented flour", because the roller system was patented. By this system, they could make much more of the better grades of flour, and, after a time, these better grades of flour were designated by the words "patent", and "straights" and "clears", and so on. Now,

as I understand, a patent means a flour which represents—the top grade of the flour, taken out of a certain wheat. It does not necessarily mean that each and every miller can do that with the same skill; that some specially equipped mills can do, that are especially fitted up for doing the finest sort of purification, or have skilled millers, that have made a life study of getting rid of the impurities. Then, again, a patent flour may represent one hundred per cent of the middlings.

## By Mr. Butler:

Q. Of what?

A. One hundred per cent of the middlings. According to our analysis, if a miller takes out one hundred per cent of middlings, and he makes his first, fifty per cent, of those middlings they analyze a certain percentage of gluten, a certain percentage of ash, and, if he takes his break flour, and purifies it, and it is analyzed, it shows the same percentage of gluten, the same percentage of ash, and that is as good as the first fifty per cent. Now, if you mix those two, he has got what is commonly called a straight flour, but it analyzes one hundred per cent, and it is all patent.

Q. Now, is it your opinion-

A. (Interrupting) I have not finished yet. The patent, as it is used, simply refers to the best part of the flour, which contains the least amount of impurities. Now, if a man can get

rid of all those impurities, why, every bit of the flour taken from the middlings, can then be called "patent". It is the

only description I can give.

Q. Now, I will ask you, as to flours which have been examined and passed as patent flours—is it within your knowledge that they vary in percentage of the total flour, and if so within what range?

A. Well, all the way from fifty per cent up to one hundred

per cent.

- Q. What is the difference between a hard and soft winter wheat, and between these and spring wheat?
  - Mr. Butler: That is objected to as irrelevant and immaterial.

1402 The Court: He may answer.

The Witness: What was that question?

By Mr. Elliott:

Q. What is the difference between hard and soft winter

wheat, and between these and spring wheat?

A. Well, the spring wheat is hard wheat, and contains, usually, more gluten, and a higher percentage of ash, than that obtained from the flour obtained from the hard winter wheat, although a great many of the flours from hard winter wheat have a much deeper yellow color than the hard spring wheats. The soft winter wheats contain less gluten, are much lighter in color, and have less ash.

Q. I want to ask you in regard to the possibility of practicing deception, in any way whatsoever, by the use of this bleaching process. Take flour, as it may be bleached in any of the ways known to millers, what do you say as to that?

A. I say that it is absolutely impossible to practice decep-

tion by bleaching flour. It doesn't make any difference-

By the Court:

Q. (Interrupting): By what?

A. By bleaching the flour. It doesn't make any difference whether the flour is bleached, or unbleached, the same sort of a deception can be practiced,—if it is possible to practice such a thing about it,—by using unbleached flour, as it is using the bleached flour.

Q. Take a flour containing a certain percentage of impurities—and, by "impurities" I mean bran, or fibrin,—assuming that that flour has a yellow color, and take the same flour, bleached, I will ask you, in your judgment, which of those flours will conceal the impurities, to the greater extent.

A. The unbleached flour, by far, for the simple reason that the yellow color stains that flour, and in that way, of course, hides these impurities. The moment you take out that yellow color, you have a white background, and all of these im-

1403 purities are exposed.

Q. Doctor, in the process of bleaching by this Alsop machine, I will ask you if, in your opinion, either nitrous acid or nitric acid is added to the flour.

A. Not as far as I have been able to determine, by very

careful tests and research.

Q. Have you examined the seized flour? A. I have.

Q. Does your answer apply to that flour? A. It does.
Q. I will ask you, assuming nitrous or nitric acids were added to this flour, in your judgment, would the acidity of the

flour be increased? A. It certainly would.

Q. If there is neither nitrous nor nitric acid in flour, what would you say as to the presence of nitrites, or nitrates, as such, in flour?

A. Well, I haven't been able to find either nitrites or nitrates

in the flour.

Q. I believe you are the inventor, yourself, of a process of whitening flour, are you not?

Mr. Butler: Will you please read the last question and answer?

(Question and answer referred to read by the reporter.)

Mr. Butler: That is the flour seized?

The Witness: In bleached flour.

Mr. Butler: Or, in unbleached flour, either?

The Witness: That would apply to the naturally aged flour, too. That would apply to naturally aged, too.

Mr. Butler: Those four parts to a million nitrites?

The Witness: There is nitrite reacting material, but that does not prove that it is nitrogen, Mr. Butler.

(Question repeated as follows: Question. I believe you are the inventor, yourself, of a process of whitening flour, are you not?)

1404 A. I am, based upon the chemical study of flour, and knowing the chemical reaction that takes place.

The Court: Oh, well, just say that you are the inventor of such a process.

Mr. Elliott: Very well.

Q. Is that process patented? A. It is patented.

Q. When was that patented?A. I think it was in April, 1907.

Q. I will ask you if you have given opinions such as you have stated here, with reference to the bleaching of flour, or the damage to bleached flour, before you invented this process.

Mr. Butler: I will object to that.

The Court: Objection sustained.

By Mr. Elliott:

Q. Doctor, I hand you a bun, or roll, I guess it is.

A. That is a minature loaf of bread. That is not a bun. Q. Well, a minature loaf of bread, and ask you to state what it is.

A. This is a loaf of bread which was made from unbleached flour. In making this loaf of bread, water was used which contained some nitrates—not nitrites, but nitrates. I added these nitrates to the water, because I was not able to get any water, the day I was home, that contained nitrates, but all deep well waters, and spring waters, and drift wells, are rich in nitrate salts, so, I added a very small amount of nitrate to my water, in making this sponge for this bread, and then fermented it in the usual bread process, and baked it, and, after I baked it, I cut off a slice, and then applied the Griess reagent to it, to show the nitrites in the loaf of bread. This shows the action of the yeast cell, on the nitrates, changing the nitrates to nitrites. They always do that. On all good, wholesome drinking water that is used in the making of bread—

Mr. Butler: (Interrupting) I object to that. I move to strike out this speech about good, wholesome water, and drinking water, and so forth.

Mr. Scarritt: He is telling what he put in it.

Mr. Butler: Well, he doped up some water, that he could . not find anything in nature.

Mr. Scarritt: I object to that remark, if Your Honor please, and I am going to object to everything that is said.

Mr. Butler: That is what he swore to.

Mr. Scarritt: It was not what he swore to,

Mr. Butler: He could not find any.

The Court: The witness says not finding them, he put them in.

The Witness: I said I did not have time; that day.

The Court: Well, that isn't it, whether you had time or not. The fact remains you said you put them in.

The Witness: I did.

The Court: Now, I think that fact may stand. Now, let us get along.

The bread referred to was here marked by the reporter as Claimant's Exhibit 227.

By Mr. Elliott:

Q. Doctor, I will ask you if nitrites occur naturally in many waters? A. Nitrites?

Q. Nitrates, I should say.

A. Yes, they are found in drift well water, in the best of spring waters, and in all deep waters. Of course, the Chicago water, we have, is Lake Michigan, and it does not have any nitrates.

Q. How does the amount of nitrates which you put into

this water-state what the amount was?

A. The amount of nitrates was, as nitrogen, is only 2.3 parts in a million, and that is—

1406 Q. (interrupting) How would that compare with waters with which you are familiar, containing nitrates?

A. It would be, if anything, a little less than what you find in these waters that I have designated.

Q. Now, explain just how you made this bread.

A. Well, that loaf of bread was made by what is called the "straight dough" method, a definite amount of flour, and a definite amount of water—

Q. (Interrupting) Now, wait. The flour, you ascertained

to be unbleached?

A. The unbleached flour was used—a flour that did not give a nitrite reacting material test with the Griess reagent.

By Mr. Butler:

Q. Let me get that.

A. A flour was used, that showed no coloration with the Griess reagent.

By Mr. Butler:

Q. And, therefore, you knew it was not bleached?

A. And it had this yellow color, and, therefore, I knew it was not bleached, and that was made up by what is commonly called the "straight dough" process, and carried through in a three-hour set, the same as a straight dough process is carried through. Then, baked out, and, after it was baked out, it was cut, and then the Griess reagent applied to the bread, which, of course turned it to pink.

Q. Now, I understand this Griess reagent is applied to nitrates. Now, if there were no nitrites there, will yiu explain how you got this color there? How did that happen? That is what I mean.

A. Well, the color, in this substance came—was produced by the fact, or for the reason that the yeast cell was changed from nitrates to nitrites, reduced from nitrates to nitrites, and, therefore, I added a certain amount of saltpetre, and that saltpetre in the water, being changed to potassium nitrite, by the yeast cell, gives this pink color with the Griess reagent.

Q. I hand you three bottles, marked "Claimant's Exhibit 228", "229" and "230", and ask you to state what they are.

A. 228 is a water extract from flour that has been naturally aged.

Q. What gives it the color?

A. The nitrite reacting material which is in this naturally aged flour.

Q. Well, has that got the Griess?

A. This was treated with the Griess reagent, and, of course, that gives it the pink color. This bottle, Number 229, is a water extract from the flour which was seized—this flour in question,—and was treated with the Griess reagent. This is filtered better than this bottle, here. This one Number 230, is a watery extract from the same flour that was seized, and then treated with yeast for an hour, or an hour and a half, and then treated with the Griess reagent, to show that the yeast took out all the nitrites.

Q. Now, I will ask you, for fear these colors may change, to just state the color in these different bottles.

A. Exhibit 228 has a rose-pink color, and the same is true in Exhibit 229. Exhibit 230 shows no pink—rose color.

Q. Now, let me see if I get this correct. This exhibit 228, is a flour naturally bleached, from which you have made an extract of water, and then you applied the Griess reagent to it. Is that correct? A. That is correct.

Q. And this liquid in Exhibit 229, is also a water extract, from the actual flour seized in this case, to which you have also applied the Griess reagent? A. That is also correct.

Q. And this bottle, Exhibit 230, is a portion of the water extract from the seized flour, to which you applied some yeast, and the Griess reagent. You first applied the yeast, and then allowed it to stay how long?

A. About an hour and a half.

Q. Then you applied the Gries reagent to that?

A. That is true.

Q. Now, just state what the significance of this exhibit is, 230.

A. Simply proves that the yeast gets rid of the nitrites, either by feeding on them, or reducing them to lower ammonia compounds, or possibly nitrogen. I believe it is food for the yeast, so far as I have been able to determine.

Q. Let me ask you, is that the same yeast you use in bread?

That is the same identical yeast we use in breadmaking.

Now, if you take that same yeast and put it in bread made from this flour, and assuming it contained nitrites, what do you say, on the basis of this experiment, would be the result?

A. It will either take all the nitrites out, or leave in prob-

ably one tenth part in a million.

Mr. Elliott: These exhibits are introduced in evidence.

Q. I hand you a biscuit, numbered 231, and ask you to

state what that is.

This is a biscuit made from flour which was an unbleached flour, containing no nitrites, but this flour was exposed to the air in the kitchen, the same as we keep it in the pantry, or around on the table.

Q. You mean in your kitchen?

Yes, sir, in my kitchen. And this flour was then baked into biscuits—baking powder biscuits. A certain amount of the Griess reagent was used, of course, in this mixture, and the Griess reagent was simply used to bring out the red color, which would be produced when there is nitrites, or nitrite reacting material in any substance, such as flour, or otherwise.

Did you ascertain what the nitrite content of this flour

was, before you made this biscuit?

That was one and one half parts of nitrogen, as nitrites, in a million.

Q. Now, let me see if I get this straight. This biscuit is made from flour which you had-

Mr. Butler (interrupting): That is all repetition, Mr. Elliott.

Mr. Elliott: There is just one thing I want to get,

Q. (Continuing)-made in your kitchen, and instead of mixing it with water, you mix it with the Griess reagent?

 Griess reagent, and baking powder, yes, sir. Q. Did you hear Miss Wessling testify? A. I did.

Q. And see the biscuits that she had made up with the Griess reagent? A. Yes.

Q. Would this be a comparable experiment, in your judg-

ment? A. It would.

Mr. Butler: Just wait a moment. I think we should leave it to the jury whether it is or not.

Mr. Elliott: Well, I meant made in the same way.

Q. You did the same substantial thing?

I tried to make it the same.

Q. Now, will you break this open?

(Witness does so.)

Q. I hand you a little vial, marked Claimant's Exhibit 232, and ask you to state what that is.

A. This exhibit is some of my saliva, collected this morning,

and treated with the Griess reagent.

Q. I hand you a second vial, No. 233, and ask you to state what that is.

A. That was reduced from two hail stones I picked up in Chicago, Saturday. We had a little hail storm there lasting about five minutes, and I picked those up off the roof, and washed them thoroughly, and then dissolved them, and treated them with the Griess reagent, showing, of course, the nitrite reacting material in it.

Q. I hand you a box marked Claimant's Exhibit 234,

1410 and ask you to state what that is.

A. That is a package of Kingsford Oswego Corn starch, and I have added—

Mr. Butler (interrupting): I think we will object to his going into that, as irrelevant and immaterial.

The Court: What do you claim the relevancy of this is, Mr. Elliott?

Mr. Elliott: We want to show that corn starch takes up nitrites from the air, just the same as flour would take it up from the air.

The Court: Oh, well, go on. I don't see much relevancy to it.

A. I added the Griess reagent to Exhibit 234, a package of Kingford's Oswego Corn Starch, bought on the open market, and treated it with the Griess reagent this morning.

Q. Now, when you treated it by the Griess reagent, just

what did you do?

A. I added a few drops to the top of the starch, and, as the color shows there, it turned into pink.

Mr. Scarritt: Showing what?

A. Showing that there are nitrite reacting materials in this flour, or in this corn starch.

By Mr. Elliott:

Q. I hand you a jar marked Claimant's Exhibit 235, and ask you to state what that is.

A. 235 is a New England Boiled Dinner, which I prepared. It is composed of corn, beans, ham, potatoes, and white turnips, and these were all cooked together, and then I poured off all of this water, because there was too much nitrites here to give a reaction with the Griess reagent, and added a little more water, and diluted it sufficiently, and then added the Griess reagent. There was too much nitrites present, to give a reaction of the Griess reagent.

411 Q. Now, I want to ask you the significance of that?

What do you find in that?

A. I find in this a nitrite reacting substance that gives this pink color with the Griess reagent.

Q. Now, you stated that there were too many nitrites in that, to give the reaction. Has the Griess reagent limitations?

A. Well, it only reacts when there is infinitisimal quantities of nitrites present. As soon as you get as little as 35/10,000 of one per cent of nitrite reacting material, the Griess reagent will not react—will not make this dye.

Q. I hand you two jars, marked Claimant's Exhibits 236 and 237, and ask you to state what they contain, mentioning

them by number.

A. No. 236 is Pillsbury's Best Flour, unbleached, which was kept in the kitchen in this jar, properly stoppered, and then sealed with paraffin. I removed the paraffin this morning. This glass jar was put into my kitchen January 24, 1910. The nitrites in this flour, or nitrite reacting material, is a very, very minute trace.

Mr. Butler: What flour is that?

A. Pillsbury's Best; here is the same flour which was exposed to the air, No. 237, from January 24, to February 14, 1910, to show how rapidly the oxides of nitrogen in the air will take out the yellow color, and this contains two and one half parts of nitrite reacting material, per million, and the color is gone out of the one, and the color is still in this one, because the air has not been able to get at this sample of flour.

Q. One is 236, flour which was sealed so that the air could

not get to it? A. Hermetically sealed, yes, sir.

Q. And Exhibit 237 is a portion of the same flour, exposed to the air? A. Yes.

Q. Of your kitchen? A. Yes.

Q. And that contained how much nitrite substance? 1412 Q. It contained, when I made the examination in the latter part of February, two and one half parts nitrite reacting nitrogen, per million.

Q. I now hand you two paddles numbered Claimant's Exhibits 238 and 239, and ask you to state what they are?

A. Exhibit 238 is the flour that I secured and placed in my kitchen. The right side of the bar is the flour which was kept in the bottle, which was hermetically scaled.

Q. Now, just put the figure 1 on the board, and mention it by number. A. And, two, here?

Q. Yes.

A. No. 1 is the flour which was kept in the bottle, and which was hermetically sealed. No. 2 is the same flour which was exposed to the air, in the kitchen. Both of these flour sticks here have been treated with the Griess reagent, to show the nitrite reacting material.

Q. These are the same flours that are in Exhibits 236 and

237? A. In those bottles, yes.

Q. Now, what is Claimant's Exhibit 239?

A. I will mark this 1 and 2, as I did the others. No. 1 is an unbleached flour, called "Hunter's Cream" flour, made by the Hunter Milling Company, at Wellington, Kansas, unbleached flour. This is the same flour, exposed in my room, at my hotel, for eighteen hours.

Mr. Helm: How long, Doctor?

A. Eighteen hours, and both of these were treated with the Griess reagent, to show the color.

By Mr. Elliott:

Q. The one on the right, No. 2, is the one that was exposed for eighteen hours in that room? A. Yes, sir.

Mr. Scarritt: Originally unbleached flour, did you say?

A. Originally unbleached flour,

Mr. Scarritt: When you say unbleached, you mean unbleached by this process, or any other process—chemical process?

A. Yes.

Q. Doctor, it has been stated here, in substance—not pretending to quote anyone—just the substance of the testimony, as I have understood it—that our body is not used to nitrites; that they are foreign to the body and so forth. What do you say as to the occurrence of nitrites in the body, and how they

are disposed of?

A. Well, nitrites, as far as I have been able to determine, are present to a more or less extent, always, in the body. They are found in the saliva, for the reason that we take in nitrates with our vegetables that we eat—those that contain nitrates, and these nitrates are eliminated, to some extent, by the kidneys, also by the salivary clands, and when the nitrates eliminated by the salivary glands come in contact with the bacteria that always exist in our mouth, the nitrates are immediately reduced to nitrites. We swallow these. These nitrites go into the stomach, and there are other bacteria, down there, that

immediately begin to feed on these bacteria. In fact, I have taken subjects and sent them-

Mr. Butler: Wait a moment. We object to this as not responsive to the question.

Mr. Elliott: Why, it is entirely responsive.

The Court: Oh, no. He has answered the question. Now he is going off on another matter.

By Mr. Elliott:

Have you made any tests to ascertain this fact? Q.

Well, I have found in artificial digestion that the nitrites disappear in that digestion, and have also given some of my assistants test meals of bread containing nitrites, and pumped them out after a half hour, some an hour, and ex-

amined the stomach contents, and find no nitrites pres-

1414 ent.

I believe you stated you were a physician?

I am. I practiced for about six or seven years.

Are you familiar with nitrites, and the administration and effect on the body, and so forth?

A. Yes, I have given nitrites.

I want to ask you this: From your investigation of flours treated by the Alsop process, state whether or not the quality or strength of these flours, or bread made therefrom, has been in any manner reduced or lowered, or injuriously affected?

Mr. Butler: Objected to as repetition, and calling for a conclusion, reading in the statute, is all he is doing.

The Court: Well, he may answer. That has been gone over a number of times. Go on, let us get through.

A. I have never found a flour that was bleached by the Alsop process which was in any way reduced or affected by this process.

By Mr. Elliott:

Q. Assuming that the flour in question has been subjected to a current of air, in which there has been an electrical discharge; that, by this process, the flour has been whitened, and there has been imparted to it nitrogen as nitrites, in an amount equal to 1.8 parts per million. Assuming further-

The Court: (Interrupting) Now, you mean plus what was already in there, do you? Let us understand that.

Mr. Elliott: Oh, no, after.

The Court: But he says nitrites are in everything. Now, you are putting this much more in? Plus what was already in? Mr. Elliott: Well, I understand the witness to-

The Court: (Interrupting) Go on. I don't understand it. I will withdraw my suggestion.

By Mr. Elliott:

Q. Assuming further that, after the flour has been prepared for food, there still remains in the food an amount of nitrogen, as nitrites, equal to one part of per million. What would you say as to whether or not the nitrogen, as nitrites, thus retained in the food, would or would not render such articles of food injurious to health?

A. It would not.

Q. Assuming all the facts to be true, as set forth in the preceding question, would the presence of that amount of nitrogen, as nitrites, in your judgment have any effect whatever upon the health of persons consuming the food?

A. It would not.

Mr. Elliott: You may take the witness.

(Five minutes recess was then taken, after which the crossexamination of the witness by Mr. Butler, proceeded as follows:)

## Cross-Examination

By Mr. Butler:

Q. Doctor, you gave me the impression that you were in favor of bleaching flour with NO2. Is that right?

Mr. Scar. tt: We object to that, if your Honor please, as not a proper question.

The Court: He may answer.

Mr. Scarritt: We save an exception.

A. I am in favor of bleaching flour with any agent which does not introduce any deleterious substance to the flour.

By Mr. Butler:

Q. Are you in favor of bleaching flour with NO2?

If NO2 bleaches flour, yes.

- Q. Does NO2 bleach flour? A. It does not,
  - Q. Does the Alsop process bleach flour? A. It does, Q. What is the bleaching reagent? A. N2O3.
- 1416

N203? What is that? 0.

- That is nitrogen tri-oxide.
- Nitrogen trioxide? Now, is that the best bleaching reagent known? It seems that you favor bleaching. Now, I want to know if that flour that has been seized, has been subjected to an inferior method of bleaching, or whether it has been subjected to a proper, scientific bleaching?

Mr. Scarritt: We object to that, if your Honor please, as not proper cross-examination, and as having nothing to do with the issues in this case.

The Court: You may answer.

Mr. Scarritt: We save an exception.

The Witness: Read it.

(Previous question read by the reporter.)

A. Well, there are about eight answers to that question.

By Mr. Butler:

Q. And I do not suppose you will give me any, by the time you get through.

Mr. Scarritt: We object to that method of cross examination, if Your Honor please.

The Court: Go on and answer.

Mr. Scarritt: We except.

A. Nitrogen trioxide is one of the best, for bleaching flour.

Q. Is the Alsop process—

A. (Interrupting): I would like to finish my answer, sir.—and when bleached properly with nitrogen trioxide, it does not introduce any product which is objectionable to the flour, because it introduces the same thing that the flour will take up from the air.

Q. When bleached improperly, what does it introduce?
A. I do not understand, what you mean by "improperly".

A. I do not understand, what you mean by "improperly".

Q. Well, you said when bleached properly it does not introduce anything. Now, when it is improperly bleached, what about it?

1417 A. I mean flour that is bleached for the purpose of removing the color, and still have it remain a com-

mercial product.

Q. Yes? Now, I want to ask you some questions in chemistry that are very simple to you, but very hard for me, and if you will turn around and look at the blackboard. Does this flaming arc produce NO2 in the Alsop process?

A. The flaming arc does not produce NO2.

Q. Does the electric spark ever, under any circumstances, produce NO2?

A. Not when the spark acts at that second, no.

Q. Does the flaming are ever produce NO2, under any circumstance?

Not the arc itself. It produces NO, but not NO2.

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Q. When NO untied with the air, then NO2 results?

A. You get some NO2, and some N2O3.

- .Q Some N2O4?
- A. Of course, we would have NO2. You would naturally get some N2O4, because they are the same substance.

d. Is NO2 nitrogen peroxide? A. It is.

Q. Is there water in flour?

A. Well, there is always from ten to 11 or 13 per cent of moisture, but you do not recognize it as water.

Q. No, but it is moisture?

- A. Yes, it is moisture. You do not recognize it as water.
- Q. So that, in a 50 pound sack of flour, there is about five pounds of water?

A. Yes, something like that.

Q. And, in 50 pounds of bread there is from 15 to 20 pounds of water, is there?

A. How much water?

Q. 15 to 20-30 to 40 per cent.

A. In 15 pounds of bread?

Q. 50 pounds of bread. A. Oh, yes, yes.

Q. If nitrogen peroxide gas comes into contact with 1418 water, will nitric acid and nitrous acid be formed?

A. After a time, yes.

Q. Yes? Is nitric acid poisonous?

A. In sufficient doses, yes.

Q. Is nitrous acid poisonous?

A. In sufficient doses, yes.

Q. Is nitrogen peroxide a poisonous gas?

A. In a large enough dose, yes.

Q. Is N2O3 poison?

A. In large enough dose, yes.

Q. Is NO poisonous?

A. If you could get it into the lungs as NO, I don't know whether it would be or not.

Q. Is N2O poison?

A. N2O? Well, if you would give a person probably—oh, eight or ten pounds of the liquid gas, it might be poisonous. I took as high as five pounds, at one setting.

Q. It will render you unconscious at once, won't it?

- A. No, I took it as an anaesthetic, for a surgical operation.
- Q. It was the first anaesthetic known in surgery, wasn't it? A. N<sub>2</sub>O?

Q. Yes. It was what was known as "laughing gas"?

A. I don't know whether it was or not. I think chloroform was the first one; I may be mistaken, I do not know.

Q. If you pour nitric acid on flour, will it hurt the flour?

A. Why, yes, it will ruin the flour.

Q. Will it poison the flour?

A. It will not poison the flour, no.

Q. Will it render the food harmful?

- A. That would depend on how much nitric acid you put in.
  Q. You saw some pieces of bread here on a plate? They
- Q. You saw some pieces of bread here on a plate? They were not marked as an exhibit, that had some nitric acid poured on them, did you?

A. I don't know whether I saw that, Mr. Butler.

- Q. You did not? You cannot remember that? Well, if you were to take some ordinary nitric acid, such as you buy at a drug store, and wet bread with it, would it be good to eat?
- A. Well, that would depend, entirely. I would not want to eat it, but it would not be poisonous, unless you put it in, just like this—

Q. Now,-

A. (Interrupting) Let me explain.

Q. Let me make my question clear. If you were to take nitric acid and soak bread in it, as people sometimes do in their tea, or milk, would the bread be good to eat?

A. It most certainly would not.

Q. It would be very poisonous, would it not?

A. Liable to be very poisoneus in that case, yes, sir.

Q. Do you think nitric acid is a good condiment to season flour with?

A. Well, I do not believe there is any nitric acid in bleached flour that I have examined.

Mr. Butler: I move to strike that answer out, as not responsive.

The Court: That is not responsive.

The Witness: Read the question.

(Last question read.)

A. That would depend entirely on how much nitric acid you put into the flour.

By Mr. Butler:

Q. Is it a valuable addition to flour, in any quantities, however minute.

A. I know of no value of the nitric acid in flour, as nitric acid, itself, no, I do not know of any.

Q. Do you know the substance called nitrous acid, in solution, in water? A. I do.

Q. Is nitrous acid in solution in water, fit to use, to soak bread in, to eat, or will it make the bread poisonous? Mr. Scarritt: We object to that, if Your Honor please, because there is nothing in this case upon which that ques-

1420 tion can be based, and it is not cross-examination of this witness, at all, and not pertinent to any of the issues in this case.

The Court: He may answer it.

Mr. Scarritt: We save an exception.

A. Well, I don't believe you could get any nitrous acid you could soak bread in. I do not believe you could buy it.

Q. Can't answer the question, then.

A. Well, nitrous acid—there is a certain amount in water, but it does not exist in that form.

Q. Do unbleached flour contain nitrites?

A. Unbleached flours contain nitrites.

Q. How do you know?

A. Now, wait a moment. I have not answered that question.

The Court: He was simply asking the question, to get an understanding of it.

Mr. Butler: Oh, I thought he said that they did.

The Court: At least, I thought he was reflecting on the question.

The Witness: I was, sir. Unbleached flour that contain their natural yellow color, do not contain nitrites, or possibly only the very minutest trace.

By Mr. Butler:

Q. So, it is true, generally speaking, that unbleached flours

do not contain nitrites, is it?

A. Well, unbleached flours, referring, now, to the color in the flour—and the color has not been changed in any way— I would say that it would not contain nitrites. At least, I have not found it.

Q. Does freshly milled unbleached flour even contain nitrites? A. Yes, sir.

Q. Before bleaching? A. Before bleaching.

Q. Are nitrites normal constituents of wheat?

A. Very rarely.

1421

Q. Usually, are they? A. No.

Q. Almost unknown? A. No. Q. It is not almost unknown?

A. Oh, no; it is not known that they sometimes contain nitrites, Mr. Butler.

Q. Nitrites of what?

A. Well, I am using the general expression in this, that is-

Do you use it to mean nitrite reacting material? Q.

That is the way I use it, yes, nitrite reacting material. A.

Is nitrous acid nitrite reacting material? Q.

That is one, yes, sir. A.

When Mr. Elliott asked you if flour contained nitrous Q. acid, or nitrites, and you said no, did you mean that it did not contain nitrite reacting material, and did you quibble on the meaning of that work?

I did not quibble. I did not mean what you have in mind, at all. I said the flour contained nitrites; that it did not contain nitrous acid; that it contained nitrite reacting mate-

rial, which is not nitrites. Is that clear?

Yes, it is clear, and it is clear to me that, by that answer, you sought to avoid disclosing that it contained nitrite reacting material.

You are entirely mistaken, Mr. Butler. You are entirely A.

mistaken.

Now, what nitrite reacting material is there, that is not

a nitrite?

A. I will tell you. I will be very glad to do it; very happy. There are a lot of compounds that are not nitrites, that do not contain nitrous acid, but contain certain groups, that react with the Griess reagent, to produce the pink color, and they are not nitrites.

Now, name all that you can of the nitrite reacting ma-

terials which are not nitrites.

Well, I will name one, which is the terpene nitrocite, and I will name another, nitroso phenol compound, will give a reaction with the Griess reagent, which is not a nitrite, nor has it any nitrite reacting material.

Q. When you say that these flours which you have pro-1422 duced here in your experiments were unbleached, how do

you know?

A. They contained the yellow color, and they did not give the pink color with the Griess reagent.

Q. Can you tell whether a flour is bleached or not, by its

color? A. I can, by the way we examine flours, yes. By ordinary examination? Can the ordinary juryman,

or layman, pick up flour, and tell whether it is bleached or not?

I should say they could not.

Can you tell it, by examining it for nitrite reacting ma-Q. terial?

No; that is simply one indication, that is all. That is Α.

simply one, but I go on the color.

Is there any way known to flour dealers, or to merchants, by which flour bleaching can be disclosed, and if so, what way is it?

There is no way of disclosing whether flour has been naturally or artificially bleached.

Q. There is no way of disclosing it?

A. There is no way of disclosing it, so far as I know.

- Q. You have examined how many samples of bleached flour, in your business?
  - A. It would be a mere estimate—probably 15000.

Q. In how many years?

A. Since 1903 or 4, up to the present time.

Q. This was done by the Columbus laboratory?

A. Columbus Laboratory.

Q. Is that a corporation? A. That is a corporation.

Q. Eleemosynary in its character? A. What?

Q. Eleemosynary in its character?A. I do not understand the language.

Mr. Scarritt: I object to that, not having anything to do with this case.

The Court: Go on.

Mr. Butler:

1423 Q. Organized for the purpose of disseminating knowledge, or for making money?

A. It is for both. Same as you and I are here, working, for the same thing.

Q. It is organized for pecuniary profit?

A. For that and research work, because we have done it for the Agricultural Department of the United States, you know.

Q. During that same time, how many stomachs did you pump?

A. Oh, I think I have probably pumped out 3000 stomachs,

to make diagnoses of the stomach.

Q. In six years, you have examined 15000 specimens of bleached flour, and pumped out 3000 stomachs. That would be how many stomachs a day, on the average—about two stomachs a day on the average? A. Yes, I—

Q. (Interrupting) And about ten samples of bleached flour,

a day? A. Well, the flour-

Q. By the day?

- A. Just wait a minute. The flour is about seven years, and the stomachs you will have to start back to the World's Fair, in 1893, and maybe before that time, because I pumped out stomachs when I was a medical student, a great many, and before I was a medical student.
- Q. How many stomachs did you pump out after they had eaten bleached flour, to see whether you could get nitrites or not? A. Three in all.
  - Q. Three? You were sure the nitrites went in?
  - A. Yes; I was sure the bread contained the nitrites.

Q. And you are sure you could not get them out?
A. Oh, yes; 1 could get out the stomach contents.

Q. I know you got out the stomach contents, but you did not get the nitrites out?

A. The nitrite reacting material did not appear with the

Griess reagent.

Q. So, you believed you did not get that out, then?

1424 A. I could not find it, because, you know this test is so delicate it shows one part in a million—that is, one grain in 72 ton.

2. So, you are very sure you did not get it out, when you

pumped out the stomach contents? A. I am.

Q. Do nitrites affect the hemoglobin of the blood?

A. The nitrites affect the hemoglobin of the blood, when they are there in sufficient concentration, and added directly to the blood, yes.

Q. And change it to methemoglobin?

A. It does, yes, sir.

Q. Destroys the oxygen carrying power of the blood?

A. That is affected for the time being.

Q. In sufficient degree, will asphyxiate you, just as certainly as strangulation will, won't it?

A. That is true, if you give it in such concentration.

Q. And, customarily, you will turn blue, anemic, and have what is called by the doctors cyanosis, won't you?

A. You are talking, now, about real nitrites, aren't you?

Q. Yes, real nitrites.

A. Nitrites as such, would do so, yes, provided you were given a large enough dose, but I never saw a case of nitrite poisoning.

Q. Is sodium in flour? A. There is not. Q. Potassium? A. There is potassium.

Q. Magnesium? A. Magnesium and calcium.

Q. Calcium, but not sodium?

A. Very rarely, we find any sodium in wheat. Sodium chloride seems to be a poison to wheat.

Q. Will nitrogen peroxide gas, and water, treat sodium, or

potassium, or calcium, and produce nitrite?

- A. If you mix calcium or sodium or potassium with nitrogen peroxide, in water, you would slightly—yes, you would get nitrite there.
- Q. Is an electrical machine of seven horse power sufficient to produce enough nitrogen peroxide to make nitric acid and nitrous acid, if it comes in contact with moisture?

1425 A. There would be some produced, yes.

Q. Do you know, as a matter of fact, that the flaming arc is used by the Ide-Birklen Company, in Norway, to manufacture hundreds of thousands of tons of nitric acid, every year?

A. I am very familiar with that process.

Q. That is true? A. Yes, that is true.

Q. So, this flaming arc is the best known method of manufacturing nitric and nitrous acid, isn't it?

A. Yes, and that is what is going to save the human race, is the fact that the Birklen-Ide process is being operated.

Q. So we can drink the acid, you mean?

A. No. We need it. The plants are going to need it.

Q. The plants? A. We live on the plants.

Q. Well, did you mean by that, when you said it would save the human race, that nitric acid was potable, fit to drink?

A. I mean by the fact they got this process up, and could make it by the flaming arc, and that we have now a new way to produce cheap fertilizer. That is what I mean.

Q. To make fertilizer? A. Yes, to fertilize the soil.

Q. And because it will make fertilizer, it will save the human race? That is what you mean?

A. Yes, fertilize the soil. That is what we need.

Q. Do you think that is a good reason why it should be added to bread?

A. I do not think that nitric acid or nitrous acid is added to bread.

Q. I know you do not, but assume it is, by the Alsop process; because it is a good drug, or chemical for fertilizer, do you think it should be added to bread?

Mr. Scarritt: I object to that as mere argument, if Your Honor please.

The Court: He may answer.

Mr. Scarritt: We save an exception.

A. That would depend entirely upon how much you 1426 added to the flour, sir.

By Mr. Butler:

Q. Well, will nitric acid destroy that pipe (referring to an exhibit)?

A. Just the same as oxygen will, in the air, yes, sir.
 Q. Is nitric acid a corrosive acid? A. Certainly, yes.

Q. With an engine, seven horse power, generating NO2, and passing out through a pipe, do you think it will corrode the pipe?

A. Well, I do not believe it would, any more than the

oxygen with moist air acting on it would.

Q. I am not asking you about oxygen. I am asking you if nitric acid, made by an Alsop machine, of seven horse power capacity, and pumping through a pipe, will destroy the pipe, in time?

A. I do not know that the Alsop machine makes nitric acid. I do not know that it makes it. I have never found any nitric acid in the Alsop machine. I would have to assume that, first.

Q. Well, assume that.

A. Well, if it made nitric acid, and it was there in sufficient concentration, it certainly would—

Q. (Interrupting) Eat holes in the pipe, wouldn't it?

A. Yes. Destroy the pipe, the same as oxygen in the air would do it, with water; but I do not know that there is any nitric acid manufactured by the Alsop machine.

Q. And the oxygen in the air comes in contact with the outside of the pipe, doesn't it? A. Yes, and the inside, too.

Q. But, if you had nitric acid on the inside, you think it would beat the oxygen and the air, in working through?

A. Oh, nitric acid would, of course, eat out the pipe much

quicker than oxygen, certainly. We all know that.

Q. Do you think that NO2 is or is not produced by the Alsop machine? A. Yes, about 25 per cent of it is NO2.

Q. And the rest is N203. A. N203.

Q. The rest is some ozone? A. Very little ozone.

Q. That is a bad thing to introduce into flour, isn't it?

1427 A. Ozone?

Q. Yes.

A. Well, it is bad if you introduce enough of it. It is bad, because it injures it. Ozone does. We consider that a very fine revivifier, you know, and the elixir of life.

Q. Changes the blood into methemoglobin, doesn't it?

A. Well, ozone does, yes, to a certain extent.

Q. And if taken in quantities, would be fatal, for that reason?

A. Ozone, in large enough quantities, but, at the same

time, we have got to have it right along.

Q. Now, I want to ask you this question: Do you think that this Alsop machine, hitched up with a seven horse power, we will say, for the purposes of the illustration, pumping gas for ten minutes, we will say, into one sack of flour, would or would not impart something to the flour?

A. Well, I could not answer that question, for the simple reason you have not told me how much of the gas was introduced into that 50 pounds of flour. If you can give me that,

I will answer it.

Q. I say, all that a seven horse power made.

A. I do not know how much it makes. I could not tell you that, Mr. Butler.

Q. Well, if it produces enough of the gas to do something,

would something be added?

A. If enough were added, of course it might produce something. I do not know.

Q. Well, what I am trying to get at is this: Suppose that we took that volume of gas that is shown in Exhibit 51, and mixed it intimately with one kilogram of flour, would that impart anything to the flour? Anything at all, I am asking about?

Mr. Scarritt: I object to that, if Your Honor please, because it is not shown that that much gas is introduced into the flour.

Mr. Butler: That is just what is shown was introduced into the flour seized.

Mr. Scarritt: No, sir.

Mr. Butler: That is just what was shown by three 1428 witnesses.

Mr. Scarritt: Shown that it was that kind of gas, but not that quantity of gas.

Mr. Butler: And that quantity. That is just what was shown, precisely.

The Witness: Now, repeat the question.

(Question read by the reporter)

Q. You, of course, refer now to a freshly milled and unbleached flour?

By Mr. Butler:

Q. Yes.

A. Yes, that would react with the coloring matter of the flour, and make a compound with the coloring matter of the flour.

Q. The coloring matter is, when the flour is separated into starch and oil and gluten, and so forth—the coloring matter ad-

heres usually to the oil?

- A. Well, I would not say as to that, except in so far as that, when I took out the oil, in an oil solvent, I found a coloring matter in the oil. I do not know whether it adhered to the fat or not.
- Q. And the oil content is less than one per cent of the whole flour? A. Might be.
  - Q. Well, it is .62, stated in this patent that is in evidence.
     A. I should say the oil generally runs about one per cent.
- Q. You think that patent is wrong, with respect to the oil content, too?

A. Which patent is that?

Mr. Butler: Let me have the patent.

(Patent, heretofore marked as Exhibit 1, produced.)

Q. .62 of one per cent is my recollection of it.

Mr. Helm: That is what the Princeton University man got. isn't it?

Mr. Butler: Yes, I believe that is it. That is what Alsop says that he got in this patent which is in evidence.

Q. .62 of one per cent. Is that about the normal oil 1429 content?

Why, no, that varies. Some patent flours have one per cent, and I would think the clear, or the low grades, would run much higher in the oil content, and, depending on the wheat, also.

How much of the one per cent-we will call it one-

in coloring matter?

A. Well, I have found as high as ten parts coloring matter

in a million.

Well, now, we are talking about the flour, and let us get on the same basis, if we can. We have one per cent. Now, there is 99 per cent other ingredients, and one per cent oil.

All right, about one tenth of one per cent of the oil.

One tenth of one per cent? Q.

It is ten parts to a million. I think that would be .01. A.

Q. .01?

.01 of one per cent, as I figure it. A.

So, there are 99 other parts, plus one of oil? Q.

A.

- Now, in that oil is the coloring? A. Yes, sir. Q. And of that one, there is .01 part of it coloring? Q.
- Yes; it is ten parts in a million, on the whole flour. A.

Well, I am talking now of the oil. Q.

Well, I want to be certain of my figures, too. On the

whole flour, it is ten parts in a million.

Well, I don't know anything about your parts per million, but are you content with your answer, that, of the one per cent of oil there is 1/100 part of it, colored?

Yes. .01 of one per cent; that is ten parts in a million. A.

So then, that would be one-thousandth of the entire volume-one one-thousandth of the entire volume would be coloring matter, if your figures are right?

A. What is that?

One one-thousandth of the whole volume would be col-Q. oring matter. A. In the-

Q. Flour?

A. One-one-thousandth, yes.

Now, there is a kilogram of flour that was seized, and Q. here is the amount of gas which the testimony shows was used to bleach that flour. Do you say to this jury 1430

that that volume of gas all acted upon the color that

was found in the one per cent of oil—the one-thousandth per cent, and did not act upon the entire ingredient of the flour?

- A. Well, you ought to change your question, a little bit. You said the color that is in the oil. The color that is in the flour?
- Q. Yes, the color that is in the flour, that comes out with the oil as you have described it.
  - A. Yes. I will have to figure a little bit.
  - Q. Yes.
- A. Yes, there would be enough color there to combine with that amount of gas, as I remember it.
  - Q. Do you think it will.
- A. Ten parts of coloring matter will combine with 5.7 parts of nitrogen; about that amount.
  - Q. So, then, it is about ten to five, or two to one?
  - A. Nearly ten to six.
  - Q. Ten of coloring matter to six?
  - A. Yes; that would combine to that.
- Q. How many parts of coloring matter are there, there?
- A. Well, in Nebraska flours I have found as high as ten parts in a million.
- Q. And how many parts of the gas, according to your figures?
  - A. I should say there is probably .2 of a milligram.
  - Q. How many cubic centimeters would that be?
- A. That is 100 cubic centimeters, but that is .2 milligrams.
- Q. Now, how much gas would you have to add, so that the color would be satisfied?
- A. Well, at that ratio, assuming that in this flour here runs 10 parts coloring matter in a million, you would have to have—if you base it on peroxide of nitrogen, of course, peroxide of nitrogen would not do it readily, but based upon peroxide of nitrogen, it would be about 5.7 parts, as I figured it.
- Q. But what I am trying to get at is, how much of this gas would you need, before you had the chemical power of that coloring matter exhausted, so that it would go in and form nitrites with the gluten?
- A. Well, if you added more than what the coloring matter would take up, the chances are it would combine with the gluten.
- Q. But, I want to know how much that would be. That is what I am trying to get at.
- A. Well, it would depend entirely upon how much coloring matter is present.
  - Q. What is the average amount of coloring matter?

A. Well, I have found as high as about ten parts in a million.

Q. What is the average amount?

A. I could not say as to that.

Q. In all these years of examining this bleached flour-

A. I know, but this is a difficult matter to get at.

Q. Now, I want you to dictate to the stenographer your formula by which you determine how much gas the coloring matter of the flour will combine with, so we may show it to other gentlemen. I cannot understand you, and I would like to show it to other gentlemen, to see if they agree with you. I want you to dictate that in scientific terms, and using figures and expressions so we can test your opinion here by

other men, and see whether it is well founded, or not.

- A. Well, Professor Teller and I have been working on this coloring matter, oh, I think way back in 1906, and it varies in amounts, in different flours. You take the Nebraska flours, and the flours from the southwest, they contain a good deal of this coloring matter. This coloring matter is found widely distributed throughout the vegetable kingdom. The same coloring matter which is found in freshly milled wheat, or the flour of freshly milled wheat, is found in the yellow carrots, in pumpkins, and in palm oil. It is also found in the natural June grass colored butter, where cows graze on it, and passing through the body, goes into this yellow coloring matter. This coloring matter is what we call, in chemistry, very basic.
  - Q. I don't know as you understood my question.

    A. I am going to give you everything you want.

1432 Q. What are you trying to give me?

A. I am giving you the history of this coloring matter,

with its chemistry.

Q. I did not ask you the history of the coloring matter, or the chemistry of it all, and I move to strike out the answer, so far given, as not responsive.

The Court: Yes. That is sustained. He is asking you to give the formula.

By Mr. Butler:

Q. I want you to state the formula by which you determine that the coloring matter in this kilogram of flour will take up the gas in this Exhibit 51, and I want that in the technical language of a scientific chemist. A. All right, sir.

Q. Just the formula, and not the history.

A. Well, as near as I have been able to determine it, from the coloring matter which was crystalized, which I then treated with other chemicals, it is C10H16, known as the terpene group, and these terpens, some of them have color. The moment they become saturated either with chlorine, bromine, N2 O3, or nitrosyl chloride, the coloring matter becomes bleached, or decolorizes, because the coloring matter and these agents come in chemical union.

- Q. Now, Dr. Wesner, does the answer which you have just given me satisfy you that it is full and complete enough for you to stand upon, as a scientist, in answering the last question?
- A. All the thing I have to say is this, Mr. Butler, that I have not, as yet, made the combustion analysis on this coloring matter, but I have gotten an iodine number on this coloring matter which would correspond to C10H16, and I have got an increased weight on these pure crystals, when I treated them with N2O3, or nitrosyl chloride, which increase in weight would correspond to what this formula, C10H16, would take up.
- Q. Now, are you now satisfied that you have explained it satisfactorily, as a scientist, and you are satisfied to leave your statement upon the record, about determining that the coloring matter of this kilogram of flour, which is marked Exhibit 50, will take up gas contained in Exhibit 51?
- A. As far as the kilogram is concerned, I am. Not peroxide of nitrogen. Not peroxide of nitrogen, but N2O3, NOCL, chlorine bromine and iodine.
- Q. This nitrosyl chloride, is the best bleaching process known, isn't it? That is the one you invented?
  - A. I could not say whether it is the best.
- Q. And the Government seized some of the flour bleached by that, that was made up here in Nebraska, and the seizure is being tried at St. Louis now, isn't it?
- Q. Why, I understand the Government has made a seizure of flour bleached by this material. I do not know whether it was bleached by the nitrosyl of chloride process, or the Alsop.
- Q. Did you examine the flour, to find out how much nitrite reacting material it contained?
- A. I have never examined that flour, am not personally interested in the bleaching company.
  - Q. Just invented the process?
  - A. Invented it and sold it.
- Q. Now, let me see. On this loaf of bread, by means of the yeast, you put nitrites into the bread, so that the nitrites show on the Griess reagent?
- A. No, nitrates with water. The water contained the nitrates.
- Q. You, but by means of the yeast, you make them nitrites, didn't you?
- A. Why, I baked bread, and of course I had to use yeast, and the yeast changed the nitrates into nitrites.

Q. So, the yeast put the nitrites into the 227, there being a little nitrate in this potable drinking water that you used to make the bread with?

1434 A. That it generated the nitrites.

Q. And, in 230, the yeast took the nitrites out?

A. Took nitrites out?

O. Yes. A. Yes, that is right.

Q. So, this yeast will do whichever way you want it to it will put nitrites into bread or take it out of the flour?

A. It will put nitrites into the bread, when you have nitrates to start with, because the ferment of the yeast—not the live cell, now, understand, but the ferment that the cell secretes, like pepsin, from the stomach, for example, that acts upon the nitrates and reduces them to nitrites. Then, the cell comes along, and takes up the nitrites.

Q. And, Dr. Wesener, these nitrates, such as you added to

the bread, are common in water, are they not?

A. The nitrites?

Q. Nitrates.

A. Are very common to spring waters, drift wells, and

large wells.

Q. And, in the speeches that you have made all over, before bakers, and millers, and before the Secretary, you have held forth to the extent that there could be no danger of nitrites, because the yeast destroyed the nitrites, didn't you?

A. Yes, and I still hold to that.

Q. But, if they happen to use the water which runs in the farmer's well, or in the spring, where these nitrates are so common, the yeast will put in the nitrites, won't it?

A. Certainly, yes. That is right. You are correct.

Q. Then what are you trying to prove by these speeches that you have been making?

Mr. Scarritt: I object to that, if Your Honor please.

The Court: Yes, I think that is objectionable.

By Mr. Butler:

Q. Now, you have gone before bakers' and millers' associations, and written for the millers papers, and all that?

A. And scientific societies,-please put that in.

1435 Q. And advocating in every conceivable way the idea of bleaching flour haven't you, and advocating this Alsop process, and this nitrogen peroxide gas? You have done that constantly since the thing came in, haven't you?

A. I have never defended the Alsop process, as an Alsop process, or any other bleaching company, but I have only defended the pure, honest science, in this thing, and I have had no replies from the other side, to my scientific papers.

Q. No, I think you are wholly unanswerable. Did you state this, "If you take a piece of ham for breakfast, you are going to increase the nitrite in your saliva, inside of ten or

fifteen minutes." A. That is right, yes, sir.

Q. "When the gastric juice begins to work, the stomach will absorb the saliva, and throw it out through the salivary glands. I would say, further than that, you get an individual taste of saltpetre, potassium nitrate, that, inside of five minutes, you would find nitrite in the saliva." You said that, to Secretary Wilson, didn't you?

A. Let me see what that said, there. Is that mine? You

will have to show me. I am in Missouri, now.

Q. Well, don't you recognize that as the truth?

A. I recognize some of it.

Q. Now, isn't it true that, if you eat ham, with these nitrites in it, that that will put the nitrites in your saliva?

A. Yes.

Q. Isn't it true that, if you eat bleached flour bread, with nitrites in it, that that will put it in your saliva?

A. Yes, these nitrites.

Q. Do you agree with Judge Scarritt on 90 per cent of all the flour in the country, is filled with nitrites?

A. I could not say.

Q. You have reported this, that 90 per cent of it has?

A. Oh, in those days, yes.

- Q. Now, isn't that one of the reasons why you find nitrites in the saliva, because people are fed nitrites in bleached flour bread?
- A. I should say not. You will not get many nitrites from bleached flour.

Q. Why?

A. Because the nitrites I do not think would ever reach the circulation; from bleached flour, as it is commercially bleached. No, I think it is destroyed in the stomach. I do not think they would ever pass the wall, to speak of. I do not believe they would hardly pass the wall.

Q: Now, this specimen of this New England dinner. Where

did you cook that?

A. Columbus Laboratory—the corporation you spoke of. Q. And cooked it for the purposes of evidence in this case?

A. I just wanted to make a picture demonstration.

Q. And you found more than 35 parts per thousand?

Mr. Scarritt: Million?

Mr. Butler: No, more than three and one half parts per thousand.

The Witness: No, I said 35/10,000 of one per cent, which would be 35 parts in a million.

Q. 35 parts in a million?

A. Yes. Now, I do not say that that corned beef or ham contains that much, but I boiled it all down, concentrated it, you understand.

Q. Oh, I see. At the Columbus?

A. I found it became so strong, what was in there, understand. Then, it became so strong in spite of the little that was present, the Griess reagent could not show the color.

Q. I see. You concentrated it and boiled it down, and you got it so strong that it wouldn't work, and then you had

to dilute it back?

A. No, I am sorry I did not bring that liquid, because, really, it would have been against you.

Q. Well, that is the reason you left it at home, I am sure,

because you did not want to hurt us?

1437 A. No; I thought that was enough of a demonstration.

I poured that off, and discarded it.

Q. Now, I am going to stick to the thousand. In your opinion as a pharmacologist, toxicologist, and medical man, three parts per thousand of nitrites of sodium, in bread, would render it injurious to health?

A. Three parts of nitrite of sodium, in bread?

Q. Yes.

A. Well, of course I would have to assume there is sodium in the flour. There is no sodium there you know, and there is no sodium nitrite, and no nitrite in the flour, nor in the bread, you know. It is an assumption, of course, that does not exist in this case.

Q. You think it does not?

A. Oh, I know it don't. I know it don't.

Q. Well, I know, but I want to find out whether this stuff that is necessary for life—I want to find how much we must

put in our bread, so we will live long.

A. All right. I figure that in about two and one half loaves of bread, you would get about 4.3 grains, or three parts in a thousand, sodium nitrite. 4.3 grains, and a half a loaf a day, would be a very good average, I think. That would be less than a grain a day, wouldn't it? Well, I do not know just whether a grain a day would really have an injurious effect, or not? I doubt it, because I think the bacteria would eat it up—live on it, as food, but I have not made that particular experiment. I have given, in one case, as high as ten grains sodium nitrite, and I have given it in smaller doses for some little periods.

Q. Well, doctor, I want to be perfectly fair with you, and

I am sure you want to be perfectly fair with me.

A. I certainly do.

Q. In your answer to the last question, you said that would be about a grain of sodium nitrite, each day, in bread?

A. On a half a loaf.

Q. On a half a loaf consumption. I think that is fair. Now, what I am asking you to tell this jury is whether or not you think that would injure the bread and make it dangerous to health?

A. Well, I should say that, in the first place, you cannot

have sodium nitrite in the bread.

Q. So? Now, don't bother about that. I mean, assuming there is sodium in the bread, no matter how it is in the bread. or whether it [as] put in purposely.

A: As sodium nitrite?

Yes, as sodium nitrite. Now, would that hurt the bread any?

A. I doubt very much whether that amount would hurt the

bread, and make it injurious.

Q. Then, your idea would be that, for the sick and the well. the old and the young, the babies and the grown persons, that that amount of sodium nitrite in bread would not render it in any degree, however slight, injurious to health?

A. I doubt whether it would. Of course, I would want to

experiment on that.

Q. That is, you would want to take a baby, and for about a month, if the baby lived, keep giving it the grain of the sodium nitrite, in the bread, to see whether it would be injurious to health? A. I did not know babies ate bread.

Q. Didn't you? A. No, I don't know that they eat bread.

You had better come to my house once, and see whether they do or not.

A. Well, I have never had any; perhaps that is the reason I

do not appreciate it.

That is the reason you are in favor of nitrites in food,

perhaps. A. I am sorry.

Now, I want to ask you, as a doctor, whether or not a grain of sodium nitrite in the daily bread, consumed by a child old enough to eat bread, would render that injurious to

the health of the child? A. It might,

1439 Q. Do you think that it would?

- A. I could not tell, positively, unless I might make such tests.
- Now, with respect to an adult in middle age, like this juryman, here, a well, strong, healthly looking man. Do you think that a grain of nitrite of sodium in this bread each day would be injurious to him, at all, in any degree?

A. Well, that would depend somewhat on the resistance of

the juryman.

Well, we will say he is a normal man.

A. Well, he looks it.

Q. Yes?

A. And what his physical condition is, and the rapidity with which the nitrite is eliminated by the bacteria, and by the natural defense of the body,-and the body of course, has defenses for nitrites, the same as it has for other poison. I would not be able to answer that question, because you are getting down to such a small dose that it is rather difficult, you know, to ask if any injury would be produced.

Q. Do you think you could perform that experiment?

A. Oh, yes; yes, I can.

Now, let us get at this: Would two grains a day,-that is, one for breakfast and one for supper-injure the ordinary man's health, in your judgment?

A. Why it might do that; yes.

- Q. How would it do it? Now, would that injury manifest itself?
- A. Why, it might produce some gastro-intestinal disturbances and it might bring about some tissue changes. I would not be able to tell, because I haven't had any experience with sodium nitrite in any experimental way. You see, sodium nitrite don't enter into this question, at all.

Q. Are there any nitrites that are poisonous.

A. I would consider that sodium nitrite, and potassium nitrite, and amyl nitrite, in sufficient doses, are poisonous, most certainly.

Q. Amyl nitrite poisonous?

When given by inhalation, I believe, more so than if given by the stomach.

This is an organic nitrite?

- A. It is an organic nitrite. That is a real, genuine 1440 nitrite.
  - Q. Two drops of that, on a handkerchief, is a dose?

Yes. A.

And will give all the symptoms of the full medicinal dose of nitrite, won't it?

Sweet spirit of nitre is another way, you know.

Q. Do you think it would be possible to add nitrites enough to food to make it injurious to the health of the party?

- Why, it is possible to do anything. But I do not think any commercial man would be foolish enough to ruin his business by doing such a thing.
- Q. So you think the public would be perfectly safe to rely upon this; that no man would be wild enough to injure his meal, or his flour, or anything else, by putting in enough of the nitrites or nitrates or other compounds to injure his business?
  - A. Never found that, in all my examination of feod stuffs.

Q. So, you hold that the public may rely upon the sound business sense of the commercial people of this country, not to add poisons to food, don't you?

A. That, and the scientists whom they have employed to

protect them along that line, yes, sir.

Q. And you are one of the scientists whom they have em-

ployed to protect them along that line, aren't you?

A. Well, they haven't employed me, but I have gone into it for my own satisfaction, because I love this particular science, myself.

Q. Well, at any rate, you are engaged in that work, for love of the Lord, or love of yourself, or love of the people, or money,—you are engaged in it, and are defending that thing, are you not?

A. Because I know I am right. That's the reason I am de-

fending it.

Q. Now, let's see. Do you agree that the xanthro proteic reaction will take place in overbleached flour?

A. Certainly; and that flour is no longer commercial flour. It is worth about as much as "red dog" would be worth.

1441 Q. And because it has no commercial value, you think the government ought not to criticise the making of that thing, don't you, because you may rely upon the millers, that they won't make it, don't you?

Mr. Scarritt: We object to that, if Your Honor please.

The Court: I think, Judge Scarritt, it is perfectly proper to show his relations with the situation. He said, in substance, that he thinks they can rely upon the millers and producers. He may answer.

Mr. Scarritt: We save an exception.

The Witness: Well, the only object in bleaching the flour is to remove this yellow color, the same as nature does. Now, if any miller is foolish enough to put nitric acid in, enough to burn up his flour. He would lose everything.

By Mr. Butler:

Q. But it is the nitric acid that makes the xanthro pro-

A. That is, where you get nitric acid enough.

Q. This yellow flour that has been here,—that was taken from around the spout, and so on, that had been there too long—that is the xanthro protein?

Mr. Helm: Do you say, Mr. Butler, that any of that flour was brought here?

Mr. Butler: Yes.

Mr. Helm: Well, that was brought here from the laboratory.

Mr. Butler: Well, perhaps I have my exhibits confused, but I will bring in a spout that was eaten up by the "American", that was just like this Alsop process.

Mr. Scarritt: We object to that, if Your Honor please, and ask that it be withdrawn.

Mr. Butler: All right, I will withdraw it.

1442 Mr. Scarritt: I ask that the Court pass upon it.

Mr. Butler: I consent that the Court may withdraw it.

The Court: It may be withdrawn.

By Mr. Butler:

Q. Now, the overbleached flour that remains exposed to the gas too long, is the xanthro proteic reaction, isn't it, and is the result of nitric acid, isn't it?

Well, I would stop at the word "overbleached".-A.

Q. "Overtreated," I will say.

A. Well, "overtreated", I would stop long before you got any xanthro proteic reaction. I wouldn't consider that flour. You wouldn't dare to, in our business. You wouldn't have any business.

That is it,—you would ruin the business? Yes. We wouldn't get any flour to test.

Q. But I am trying to find out whether that shows the nitric acid reaction.

A. If you pour nitric acid on it, it will produce xanthro

protein. Everybody knows that,

- Now, I am trying to get your opinion, as a scientist. Assuming that flour remaining in the agitator, as described by the witness Dennison, on the side of the agitator, turns vellow. like sulphur, I want to find out if that is the xanthro proteic reaction?
  - A. That may be the xanthro proteic reaction. Q. That is the result of nitric acid, isn't it?

A. It might be the result of nitric acid, or it might be the result of the oxides of nitrogen.

Q. You were here when this Red Wing man described that?

I think I was. I don't remember that, A.

When the xanthro proteic reaction takes place in flour. is the flour made injurious to health?

Why, I don't call it flour any more.

1443 Q. Well, call it flour. Is that substance made injurious to health?

A. I have made that body, and given it to a rabbitt, and it never touched the rabbit.

Mr. Butler: I move to strike out the answer, as not responsive.

The Court: It may be stricken out.

By Mr. Butler:

Q. This pure food and drug act was not passed for the protection of rodents, or was it passed for the protection of human beings?

A. I understand this pure food act was intended for the benefit of the human race. The question is, what is beneficial

for the human race?

Q. I want to know from you whether that substance,—the flour after the xanthro proteic reaction has taken place, and it has been turned yellow—is, in your belief, a wholesome food product for human being?

A. Well, I would not eat it, but I have tried it out on

animals.

Mr. Butler: I move to strike out his answer.

The Court: It may be stricken out.

The Witness: I can't answer your question.

By Mr. Butler:

Q. Do you believe it to be a poisonous substance?

A. A test that I made proved that it was not a poison.

Q. On rabbitts? A. Yes.

Q. And you hold that food that is fit for rodents, is fit for humans, do you?

A. Very often, yes; certainly.

Q. And, as a scientist, and a defender of the commercial common sense of the country, you believe that a food that is fit for rodents is fit for humans?

A. I don't believe-

Q. (Interrupting) Do you believe that the standard?

A. We use, of course, these lower animals to make our 1444 experiments on. You wouldn't allow us to take men, of course, to feel these things to. Simply have to use the animals in order to make our comparisons.

Q. If decayed meats were thrown to rats, and didn't kill them would that prove to you it was a wholesome food for people?

A. I wouldn't say it would be a wholesome food.

Q. I asked you if it was wholesome, sir?

A. Well, wholesome enters into the question of whether it is poisonous, or not. Now, if you go into whether it is wholesome, from an aesthetic stand point, I can answer it.

Q. Well, what would you say?

A. No, it is not wholesome, from an aesthetic standpoint, because it is no longer flour.

Q. Exhibit 47 is some flour which has been treated by nitric

acid. Is that a poisonous substance, in that bottle?

A. I would say that the nitric acid, as I see it, there, is most poisonous, indeed; but it is not flour.

Q. If there was less nitric acid in it, would it be poison-

ous? If there was half less?

A. That would depend. I presume it would be.

- Q. And where it ceased to be poisonous, no man could say, could he? A. Yes.
  - Q. Well, at what point would it cease to be poisonous?

A. When you would not get any nitric acid, or any nitrite reacting material, above—oh, a few parts in a million.

Q. If the yellow color is produced, at all, would it be

poisonous any more?

A. It might not be poisonous, then, so far as poisons go.

Q. Well, not fatally, but poisonous, any more?

A. It might not be even poisonous any more.

Q. Isn't this xanthro protein, resulting from flour and nitric

acid combined, a poisonous substance?

A. It might be, in the organs, but nobody has proved that xanthro protein is a poison—that is, the xanthro

protein, excepting some of its derivatives. Q. You mean it hasn't killed anybody?

A. I don't know of any case.

Q. And until you do know of a case, you shall insist that it is not proved to be a poison, won't you?

A. I would say that the nitric acid in there is a most viru-

lent poison.

Q. Now, if our witnesses have told the truth, that nitric acid is put in this flour, a poison has been imparted to it, hasn't it?

Mr. Scarritt: We object to that, if your Honor please, as being an improper question.

The Court: He may answer, whether the acid makes the poison, or not.

Mr. Scarritt: That is not the question, if your Honor please.

The Court: I. understand.

Mr. Scarritt: Well, what about this question?

The Court: I was sustaining you, Judge, unless you talk me out of it.

By Mr. Butler:

Q. If we assume as a fact that the Alsop process, did put nitric acid in this flour, it put a poison in the flour, didn't it?

A. Well, you are assuming it was put in there, but even then, of course, if it were put in, it might be there in such an infinitesimal trace, that no chemical method we have, would disclose it; and then you must remember that nitric acid is found widely distributed throughout the vegetable kingdom, as nitrate. Nitric acid wouldn't exist in there as nitric acid. Why, that is absurd.

1446 Q. Well, let us assume it does, for the purposes of

the fact.

A. Well, you will have to assume that.

Q. Now, you have often been a witness, haven't you?

A. I think I have; yes.

- Q. And you know the office of an expert witness is to give his learned, professional opinion upon an assumed state of facts? A. Yes.
- Q. Assuming that there is nitric acid put in this flour, at the time it was bleached, was there a poisonous substance added to it?

A. A substance in certain concentration has been added to it, it would be a poison, under those circumstances.

Q. If any of this acid exists in the flour, and was added to it at the time of bleaching, was there a poisonous substance added to it?

A. In sufficient concentration, that would act as a poison, but always remember, sufficient concentration.

Q. If NO2 is in the flour, now, as such, is there a poison in it?

A. If it is added in sufficient concentration, and is there in sufficient amount, it naturally would be a poison.

Q. If strychnine was added to it, was there a poison added?

A. Yes; in sufficient amounts; yes, sir.

Q. You would answer that the same way?

A. In sufficient amount.

Q. Prussic acid is found extensively in nature, is it not? Is it not generated in nature, in the seed of the almond?

A. I know, but it is always more or less in combination.

Q. Well, I know, but prussic acid exists, like nitric acid? Now, let us assume that prussic acid was generated, and added to this flour. As an expert and scientist and medical man, I ask you if a poisonous substance was added to the flour?

A. A poisonous substance has been added by that, if it is

there in sufficient doses to be a poison.

1447 The Court: Now, what do you mean by that?

The Witness: I am going to give you an idea of a poison.

The Court: Well, suppose I dropped a log down on [on] your head; it would kill you. Now, if I dropped a chip on you, have I assaulted you?

The Witness: If you would saw that up into saw-dust it would not have a deleterious effect, no, sir.

The Court: Well, have I assaulted you?

The Witness: No. Now, poison is really a relative term. What may be a poison to one individual, in the food, may be meat and butter and bread, in another. As Shakespeare says, "what is one man's meat is another man's poison". I know people that can't eat strawberries. Some people like meat, others get poisoned from eating meat.

By Mr. Butler:

Q. Is there any substance that is a poison?

A. By itself, inherently?

Q. Yes. A. No. No such poison exists.

Q. So that, no matter what substance be added to the food of the people, you can scientifically answer that, inherently, no poison has been added, can you?

A. Because it is not there in any quantity to be recognized

as a poison.

Q. So that, if 1/60th thousandth part of a grain of strychnine be added to each biscuit that was handed to a child, you would swear that there was no poison in it, wouldn't you?

A. If the strychnine was there in small-

The Court: (Interrupting) No, no; just answer the question.

The Witness: Well, what is it-60 thousandths of a grain?

By Mr. Butler:

1448 Q. 1-60th is a dose, and this is one thousandth part of a dose. A. I would.

Q. And as the quantities increased, step by step, you would continue so to swear, until the quantity was such as had been by experimentation demonstrated to produce poisonous results in human beings, wouldn't you?

A. I would have to have enough strychnine in there to at

least obtain some minor physiological effect.

Q. You would have to observe it in symptoms, before you would recognize it as a poison, wouldn't you?

A. I would have to recognize some physiological disturbances, or some beneficial result from that, before I would recognize it.

Q. Well, that would be a symptom?

A. A symptom of some kind. Strychnine, you know is a very good tonic. It is an excellent tonic. You might give strychnine for several years, you know, to an individual, and it is very beneficial.

Q. Prussic acid, too? A. Well, I don't know.

Q. Cyanide of potassium?

A. Potassium cyanide is a salt, of course.

2. Is that a bad poison?

A. Yes. That is a very bad poison, as such.

Q. But, if that was added to flour, by the same test you would say no poison was added, unless it was in such quantities that you could observe symptomatic changes, either of well-being or bad feeling?

A. In the concrete definition of a poison, certainly I would

have to stick to it. I couldn't do anything else,

Q So you hold, no matter what it is, whether it is prussic acid, or cyanide, or strychnine, or nitrites,—no matter what they are, until there is sufficient added to the food that is consumed at a single meal that there may be some physiological effect observed, you hold that no poison has been added?

A. Oh, not at a single meal. It might be a dozen meals.

Q. All right.

A. Or the eating of foods constantly for a year. I would draw my opinion on that. It wouldn't be for a single meal.

Q. Well, how long?

A. It would all depend on the amount that was being taken, and the resistance, and a great many other questions would have to be considered, before you could arrive at it, but I assure you, I would be away on the safe side, always.

Q. Try it on the rabbit, first?

A. I would be away on the safe side of the test. It would have to be done so small—so that you couldn't weigh it, or estimate it, or recognize it, and if you didn't have this Griess test they never would have discovered anything in the flour.

Q. That has been a great misfortune, hasn't it?

A. No, not at all.

Q. It brought on all of this bleaching litigation?

A. Not at all. You let one of these others go to the first and third decimal point, but this substance goes to the fourth, fifth and sixth decimal point, and still it is a deathly poison.

Q. Now, have you much feeling about this?

A. No, only scientific.

Q. I notice you are very scientific. A. Thank you.

Q. Now, let us see about this bleaching. You say the bread is not impaired by the bleaching.

A. I am certain about it.

Q. It is not bettered by the bleaching?

A. The color is bettered.

Q. Except as to color? A. The color is bettered,

Q. There is no difference in the odor?

A. Absolutely none.

Q. There is no difference in the flavor?

A. Absolutely none.

Q. There is no difference in the loaf volume?

A. Not any more than what you would find in natural variation between two same flours.

Q. There is no damage done of any kind?

A. Not as I have examined commercially bleached flour.

1450 Q. The patent isn't lengthened by the bleaching?

A. Well, I told you I couldn't tell you, really, what a patent is.

Q. It couldn't be used to deceive any person, you think?

A. Oh, no; it can't be; no, sir.

- Q. And you find that only one part in the million is what you would call a good, honest average, of nitrite reacting material?
- A. I would call that an average of what I have found in these several years I have examined bleached flour.

Q. And four parts in the unbleached flour?

A. I have found that it is 4 parts in the million.
Q. And one part is your maximum in the bleached?

A. No, not at all. Oh, no. Not that.

Q. What was the maximum?

A. I have seen it go I think as high as three or four points,

but very rarely. That was early in the bleaching.

Q. How much air would have to be robbed of its nitrite reacting material, to put four parts of nitrite reacting material, computed as nitrogen, in a kilogram of flour? I have that figured, to save you the trouble of computation.

A. You never told me how much there was in the air.

Q. Well, you know how much there is in the air, don't you?

A. I should say not. Doctor Marshall is the only man ever figured that out.

Q. Well, let us say there is .01 to one million cubic feet

of air. A. .01 what?

Q. Part. A. Part what?

Q. NO2.

A. Yes, but what is that .01 part? Is that .01 part of a cubic foot.

Q. Of a milogram. .01 part of a milogram, to one million cubic feet of air. Now, assume that to be the fact.

A. I think you have got mixed up on that.

1451 Q. Well, assume there is one part to a billion, in the

A. One part of what? What is the one part? A billion cubic feet?

Q. No, leave out the cubic feet. Just one to one billion. How much air would it require to get four parts.

A. You haven't given me the figures yet. I don't know what one part of a billion is—whether grams, or pounds, or ounces, or what it is,

Q. Well, call it cubic foot. One cubic foot of nitrogen peroxide gas, to a billion cubic feet of air, or call it grams, or anything else you like, or units of any kind. Now, how

much would you have to have to bleach that flour, so as to put four parts in it?

A. That is peroxide, you are figuring this as, Mr. Butler?

Q. Yes. A. That is, a kilogram.

Q. I don't care whether you make it a kilogram, or what.

A. It is a kilogram of flour?

Q. Yes, a kilogram of flour. The same four parts you found in the unbleached flour, and reduced to nitrogen, or nitrite reacting material, computed as nitrogen. I want to find out how much air you would have to agitate to that handful of flour. I will not trouble you to figure it longer. You may hand me the figure in the morning, if you will. The reporter will give you the question. Does the nitrite reacting material grow less, in bleached flour, with the lapse of time—flour that has been bleached, we will say 60 days? Well you get as much, by this Griess reagent test, as you would if you took it at the time it was bleached?

A. I really couldn't answer that, because I haven't examined flour 60 days after bleaching.

Q. Haven't you examined any of the seized flour lately?

A. Oh, I have examined the seized flour; yes.

Q. But you haven't compared it with what it was?

A. I haven't compared it with what it was; no.
 Q. Doesn't a little heat drive out all of this stuff?

A. If you have heat, to the boiling point of water, it

1452 drives out this compound.

Q. Haven't you and your associate, Prof. Teller, gone through elaborate experiments to show that a little heat, some goes off, and more heat, more goes off, and over night it all goes off?

A. That is, this compound I have told you about works that way.

Q. This nitrite reacting material?

A. This nitrite reacting material; yes. That is not peroxide of nitrogen.

Q. That is what I mean. That goes off? A. Yes.

In what form does it go off?

Well, I am not absolutely certain whether it goes off partly as a nitrocite, or whether some of it splits off as N203.

Q. Doesn't the air keep putting it in all the time?

The air will keep putting it in all the time, if it can A. get at it.

Q. And if it goes out of one flour into the air, then, in the air, it will come back into the other flour, won't it?

A. I am referring, now, to the oxide of nitrogen. tainly will. You can't keep it out, because this coloring matter has an affinity for it.

Q. A bleached flour, then will also purify and bleach the

other flour that is sitting near it?

- A. Oh, no; no; nothing of the kind. Take it up from the air. No, not if that is what you mean; no.
- Q. But you have proved that a little heat drives it off in the air, haven't you?

A. It does, quite a substantial heat.

And you have also proved it grows less, as time goes on, haven't you?

A. Well, I don't know whether we have or not.

Q. And you have also proved that, right in your own kitchen, and bed room, wherever you are, and out in the open air, that the air puts it into the flour?

There is no question about that.

Q. But you say the giving off of the stuff off the bleach-1453 ed flour, would not blast the wholesome brother that was nearby,-the unbleached flour?

For the simple reason it is there as a new chemical. A.

Now, if Professor Hulett tells the jury that this flour taken out of this bag, had NO2 in it, and gave it off to the air, according to this flask illustration that was shown here,if he tells the jury about that-You remember it, don't you?

A. I do; very well. Then you would say, would you not, that it liberated NO2 in the air, and that there was an equilibrium all the

time?

- A. No. I wouldn't say that, at all. Part of this compound, as Prof. Hulett no doubt will agree with me, is volatile. These nitrocites are volatile, and what he got there was due to the nitrocites, and not the peroxide of nitrogen, at all.
- Well, let us assume it was peroxide. Let us assume that.
  - You mean oxide of nitrogen? A.
  - Nitrogen peroxide. A. All right.

That is, assume that, and that it has given it off, in the flask, and by the pump, when he pumps it out. Let us assume that to be true. Then the air would be contaminated by it, wouldn't it?

The air would contain peroxide of nitrogen; yes,

And that added peroxide of nitrogen would contaminate the unbleached flour by it, wouldn't it?

A. Well, it would be the peroxide of nitrogen, as you ex-

press it, of course going into that flour.

So, if you drive it off as peroxide of nitrogen, and put it in the air, it will contaminate the flour, won't it?

You don't drive it off. Of course, there is none in the flour to drive off.

Q. Do you use bleached flour at home?

All of it. I always want to have it; yes, sir.

That is the reason you had the unbleached exposed in your kitchen last January to February?

I used that against the Commonwealth of A. No. Pennsylvania, in that starch case, to prove how easy this starch would take up oxide of nitrogen from the air,

and they will take it up.

- You were down there, fighting the Commonwealth of Pennsylvania, so that this man with the corn starch, such as you brought in here, that had these nitrites in it, might be shown to be innocent, because the corn starch would take up the stuff from the air?
- A. I was down there with Doctor Marshall, to show how the nitrites got into the starch.
- Now, Doctor Marshall couldn't get any on his corn starch that was acid, could he?
- No, because the acid starch don't contain any bases, the same as the flour. The color is the base in the flour.

Wheat flour is acid, normally, isn't it?

Yes. The yellow coloring matter is the base, the same as the alkali is in this starch.

Q. Now, to a layman, of course, you are far superior to us, and I want you to go rather gently with me, here, and not drown me quick. Now, you agree that, unless you make the starch alkali, that it would not take in nitrites from the air, don't you? A. Yes, sir; that is true,

And you agree that, if it was acid, it would have none at all?

No, because there is nothing there to combine with the nitrites, whereas, in the flour, the yellow coloring matter is the same as the alkali in the starch, and you can't get away from It is bound to get in there.

But you say it will go to the acid flou, while it won't go to the acid starch?

Because of the yellow coloring matter; yes, sir. A.

Now, I am not asking you why, but that is the fact? Q

Oh, that is the fact, yes. A.

So we are to understand this, about it, that you can't Q. get any into starch-corn starch that is acid, from the 1455 air?

Well, very little, if any, that the acid corn starch A.

takes up.

But wheat flour, being acid, because of the strong affinity of the coloring matter in the oil for nitrous acid and nitric acid, they immediately combine?

Nitrous and nitric acid will not bleach flour, but No.

Nitrous and nitric acid will not bleach flour. N2O3.

Nitric acid will not bleach flour? A. No, sir. Q.

But you can use nitric acid to bleach flour, can't you? Q.

You use the N2O3. A.

Now, in this process where they feed the iron into the nitric acid jar,--that is, the one that the Alsop patent people had litigation with, the Naylor-Girard,-that is nitric acid?

A. It is nitric acid, but it isn't nitric acid that does the

It is the N2O3 that does it. bleaching.

Does it give off NO2?

It gives off some NO2, too, but it is largely N2O3.

Now, if you pour nitric acid onto flour, it will give off

this NO2 gas, or N2O3?

A. When you pour nitric acid on there, itself, it will not bleach, and when the nitric acid decomposes, then, of course, that gas-

(Interrupting) Well, that is another thing, just like Q. these nitrites? A. I know, but you would ruin your flour.

Q. But that is the distinction between nitrites, and nitrite reacting material, over again, isn't it? Is it merely verbal?

No, the nitric reacting material is a material which is not a nitrite, but, when the Griess reagent acts upon this compound, it makes a nitrite out of it.

I see. That is what you call the fine points of chemistry. Now, you made some digestion experiments on bleached

and unbleached flour?

I found that where the flour was really overbleached, that it digested quicker than where it was commercially 1456 or normally bleached.

Was that a good thing for the flour? Q.

That is a good thing for flour, and that is because it is recognized that mineral acids are always added to food, in the first process of digestion. We have it here every day.

Nitric and hydrochloric? Q.

Hydrochloric acid is one, nitric acid. A.

Q. Nitric acid customarily used by physicians to promote digestion?

A. Oh, yes; very extensively. Nitric acid, and also nitrohydrochloric acid. Nitric acid is often given in doses.

Q. If you put nitric acid and hydrochloric acid together, you will get aqua regia, that will dissolve gold, won't you?

- A. If you get it there in concentrated quantity; yes. You can draw terrible pictures of these things if you want to go to the extreme.
- Q. Do you believe that this digestion test which you made out of that flour was not injured?
- A. Yes, sir; because I went at it thoroughly, for a purpose, I wanted to know.

Q. When did you do that?

A. Oh, I have done that ever since we first started, I should say probably back in 1905 or 1906.

Q. And you had this all in mind when you were down at Washington talking to the Secretary?

A. Oh, yes; I knew what I was talking about.

Q. Did you say this to him: "I wish to say that I am very skeptical about digestion experiments made artificially." Did you use that language there, at that hearing?

A. Made artificially?

Q. Yes.

A. I may have said it, in that way; I don't know.

Q. You might have been joking with the Secretary down there, a little?

A. Oh, I think artificial digestion experiments are very excellent, when properly carried out, but they have got to be carried out right.

Q. No, let us see about that. Down at Washington, the party on the other side had disclosed the results of his digestion experiments hadn't he?

A. I don't think he had, at all. He did nothing of the kind.

Mr. Elliott: Now, Mr. Butler, you objected very strennously to my reading to your witness, and I gave him the book. Now, I think if you are going to ask about these things, you should show him the record.

Mr. Butler: But I want to get the situation, now.

Mr. Scarritt: I object to it, because it is not in the issues of this case.

The Court: The witness has said he made digestion experiments. Now, if he has said, upon some other occasion, that they are not to be relied upon, isn't that competent?

Mr. Scarritt: Well, if he will ask him that.

Mr. Butler: I am asking him if he did not say so. He can affirm or deny it. I am informed he did. That is all. There is a transcript here.

Mr. Scarritt.: Show him the record.

By Mr. Butler:

Now, at Washington, you took part in the hearing, in favor of the bleachers, didn't you?

Not in the bleachers. In favor of the millers.

The millers who bleached? Q.

That was away back in 1908, in November, wasn't it? The order was made the 1st of January, 1909, about.

You were there in favor of the millers who bleached?

A. Yes.

1458 Q. At that hearing it was claimed, was it not, that digestion experiments made artificially in this country and abroad, by noted scientists-

(Interrupting) Well, nobody had made them abroad.

Q. Haliburton?

I should say not. Haliburton didn't make them, at that time; at least they had not been published. They were not common knowledge.

Q. Not published in the transcript of this case?

What case? A.

The case that Doctor Shepard was there, and testified.

I don't know whether that case was tried at that time, or after. And that wouldn't be common knowledge, not even to a scientist.

Q. At any rate, it was claimed, there, that eminent scientists had established that the bleaching of flour impaired its digestibility, when tested by these artificial digestion experiments, was it not, and among those who claimed that was Prof. Shepard, who testified here in this Court?

A. No, Prof. Shepard did not testify on that. He simply

said the enzymes were affected, by certain things.

Q. And didn't he say that destroyed digestibility?

Well, I know; he assumed that, if the enzymes were affected.

Q. Just answer my question. Was it not claimed, there, by those who were opposed to the bleaching, that digestion was impaired?

A. I do not know of anyone that made any experiment,

unless it was Prof. Ladd.

The Court: He asked you if it was claimed.

By Mr. Butler:

Q. That was the claim? That was the talk?

A. Oh yes; that was the talk. That has been the talk right along.

Q. And did you make this statement in these words: "The tests we have made with flours, bleached and unbleached and unbleached

ed, in the raw state, we have found no difference, whatever, in the digestion of these two flours,—absolutely no difference. I wish to say that I am very skeptical about digestion experiments made artificially." Did you not say that?

A. I don't know whether I said that, or not. I might have said that, but if I said that last, I would know why I

said that.

Q. Oh, yes,—of course, but I don't care why you said it.
A. I don't know as I said it. My memory can't go back,
Mr. Butler, two and a half years. Is that a certified copy?

Q. Now, but your associates, here, have a transcript of this

haven't you, Mr. Elliott?

Mr. Elliott: No.

Mr. Butler: Well, what did you do with it? You had one at Philadelphia.

Mr. Elliott: Well, have I got to carry all my papers around?

Mr. Butler: Can't you recognize this?

Mr. Elliott: I don't know a word about it. I haven't looked at it in years.

The Court: Well, it is not a question of whether it is certified, or not, it is whether this witness so stated.

Mr. Scarritt: And that is for him to say.

The Court: That is for him to say, in the first instance, and then it is for other witnesses to say, in rebuttal.

The Witness: I don't remember whether I said that, and I wouldn't recognize it.

Mr. Butler: Well, I have a transcript here that was furnished me by the department of agriculture.

Mr. Helm: You haven't even offered that to the witness.

Mr. Butler: Well, I will offer this to the witness. He says the stomach is a peculiar organ; that it is like a churn, and the more you stir, the faster it goes. That is all in there, but he didn't say anything different from that, here,

Thereupon Court adjourned to 10 o'clock a. m. Tuesda , 1460 June 21, 1910.

